Windfarm acceptability and the co-operative model of local ownership

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Abstract

UK and European renewable energy targets require a wider deployment of wind energy if they are to be met. Despite a growing installed capacity of wind energy, social acceptability of wind farms is still a social factor hindering the pace of deployment. In recent years, community involvement in renewable energy projects has been increasingly advocated by many as a positive factor leading to several benefits including a wider acceptability. Interest has been risen by community schemes of whole or partial ownership of wind farms.

This thesis draws on a range of social and psychological theories to propose an original integrated theoretical framework to explain social acceptability of wind and to research the suitability of the co-operative scheme of community ownership in overcoming local opposition to wind projects. Two studies were carried out: a qualitative study surveyed the community co-operative case of Westmill in England and a quantitative postal survey investigated the opinions of residents living up to a distance of ten kilometres from four proposed wind farms in Scotland.

It was found that perceived local costs and benefits and social and individual resources influence acceptability of proposed wind farms. Further, the co-operative scheme appears not to be regarded as capable of affecting substantially acceptability, nevertheless participants acknowledge its suitability to benefit the community of the chance of participating in the revenue of the wind farm and in building social capital.

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1.1 **Introduction**

The aim of this research, performed over a period of ten years, is to study the case of community wind farm co-operatives and social acceptability of wind energy. The case of the co-operative scheme is peculiar because, although a co-operative is an economic agent, at the same time it is an association of citizens, owners of the co-operative that is self-administered democratically. In the context of renewable energy, the co-operative scheme could offer the opportunity to local people to get actively involved in renewable generation of electricity with possible advantages: decreasing opposition to local renewable energy developments, keeping into the community the economic revenue of renewable energy exploitation, strengthening the community social networks and building social capital (Bauwens et al., 2015). At the national level such experiences could be particularly valued as a means to help the achievement of the goals set by the Government of reduction of carbon dioxide emissions of 80% by 2050; in fact if the target is to be achieved, it is likely to be possible only through a large deployment of wind energy (HM Government, 2009), and the support of local communities will be a key issue (DECC, 2014).

The thesis explores two main themes: (i) the role of locally owned wind farm co-operative schemes in influencing levels of local support for proposed wind farm developments and (ii) the influence of multiple factors in influencing local acceptance of proposed wind farms.

The thesis is structured in five chapters. The remainder of this chapter is devoted to the literature review that informed the design of the data collection exercise. Chapter 2 discusses the research design itself which comprised two empirical studies: one, qualitative, whose analysis and results are presented in chapter 3, and one quantitative, whose findings are presented in chapter 4. Chapter 5 is a general discussion leading to specific conclusions and recommendations.

1.1.1 Policy context

The Energy White Paper (DTI and DEFRA, 2003) points toward renewable energy and distributed generation expansion as the main mean, along with energy efficiency, to achieve CO_2 reduction. More recently the UK Government (HM Government, 2009)

reinforced its determination in pursuing a wide deployment of wind energy to achieve carbon emissions reduction through the legally binding target of sourcing 15% of UK energy from renewables (DECC, 2011).

We can read in the Energy White Paper: “Increasing the deployment of renewables will depend on people supporting local projects.” (DTI and DEFRA, 2003, p.51) and “We see a clear benefit in local communities becoming producers, as well as consumers, of energy, establishing and benefiting from the local ownership of some forms of generation.” (p.52). So, along with the Renewables Obligation that prescribe to electricity suppliers to deliver a specified amount of their electricity originated from eligible renewable sources, specific policy instruments were employed to favour community energy initiative such as the Community Renewables Initiative launched in 2002 by the Countryside Agency.

More recently the UK Government has renewed this commitment with the ‘Community Energy Strategy’ (DECC, 2014, DECC, 2015a) where it states: “Our ambition is that every community that wants to form an energy group or take forward an energy project should be able to do so, regardless of background or location. We will back those who choose to pursue community energy, working to dismantle barriers and unlock the potential of the sector.” (p.7, DECC, 2014).

In this context Scotland has used its devolved powers to develop an even more ambitious energy policy than the one drafted for the whole United Kingdom. Particularly Scotland has set a range of ambitious renewable energy targets which requires the country to meet 30% of its energy needs (heat, transport and electricity) from renewables by 2020 and specifically 100% of its electricity demand and 11% of its heat energy demand met by renewables by 2020 (Scottish Government, 2011).

In terms of community involvement the Scottish Government (2011) has recognized the need to involve communities, promoting participation in commercial schemes and community ownership. Further it has set up a target of reaching 500 MW of installed capacity of community and locally owned renewables by 2020 and has encouraged developers to include an element of shared ownership for every renewable energy project development above 50kW (Scottish Government, 2015).

1.1.2 Renewable energy and the future electricity system

Renewable technologies are seen as a major mean to deliver an energy future with reduction of carbon dioxide and respect for the environment (DTI and DEFRA, 2003, HM Government, 2009). Within this view of the energy future are Lovins (1977),

Patterson (1999) and Rifkin (2002). All these authors foresee an energy future involving a massive deployment of distributed generation, with the transition from a centralized and hierarchical electricity system toward a decentralized electricity system, that will involve citizens as producers (Rifkin 2002), contributing with such evolution to make the electricity system and society in general more democratic. Rifkin (2002) considers the possibility that in the future, distributed generators owned by families, neighbourhoods, communities will get united in DGAs, (distributed generation associations), using the co-operative scheme that was born in the 19th century to protect consumers' rights, building a retailer structure able to deliver goods to the market at a lower affordable price.

1.1.3 Citizenship policy

The former Home Secretary David Blunkett (2003) made clear the importance of fostering active citizenship in the context of local communities, in order to successfully deliver public goods such as e.g. environmental quality, security and youth care: "We must aim to build strong, empowered and active communities, in which people increasingly do things for themselves and the state acts to facilitate, support and enable citizens to lead self-determined, fulfilled lives." (2003, p.43). The government therefore implemented this position through instruments such as Community Interest Companies (CICs), that were meant to be a new scheme of social enterprise available from July 2005 (DTI, 2004b), and the creation of the Centre for Active Citizenship, an institution devoted to active citizenship studies. In this respect local co-operatives of renewable energy can be seen as a form of practice of active citizenship enhancing global environmental quality, contributing to local wealth and strengthening community bonds therefore increasing local social capital.

1.2 Literature review –first stage

A First level of literature review was conducted in 2004 before carrying out in 2005 the first stage if data collection. Later, after suspending the research, transferring University and resuming the PhD, in 2010 an update of literature was executed before conducting a second stage of data collection.

The literature review conducted at the first stage encompassed three main areas: the concept of citizenship, theories of participation and theories of environmentally responsible behaviours (ERBs) because at the time the main aim of this research was to contribute to the SUPERGEN[1] research project in investigating active involvement of citizens in sustainable energy.

1.2.1 Citizenship

The traditional meaning of citizenship is that of membership to a political community that entitles a subject to the exercise of rights and obliges him/her to fulfil some duties (Reeve in McLean and McMillan, 2009).

Prior et al. (1995, p.5) wrote: "In our view one of the confusions in current discussions of citizenship arises from a failure to recognise that there are two distinct dimensions to the concept." And "...citizenship as a status which people possess...citizenship as a practice which people engage in." Finally: "Citizenship is thus a concept both of being and doing."

It can be seen that citizenship can be considered not just as a status, that is the traditional meaning, (it is referred here to the tradition of political thought), but also as a practice (originated from the entitlements that the status provides), consequently it makes possible to include in the debate about citizenship every aspect of the subjective public life, in this way broadening the subject towards specific sectors of political studies such as e.g. political participation.

According with Faulks (2000, p.13): "...citizenship is a membership status, which contains a package of rights, duties and obligations and which implies equality, justice and autonomy. Its development and nature at any given time can be understood through a consideration of interconnected dimensions of context, extent, content and depth.". 'Content' are the rights and duties entailed in the membership status, 'depth' is used by

[1]SUstainable PowER GENeration, (EPSRC funded), URL: http://www.rcuk.ac.uk/research/xrcprogrammes/energy/EnergyResearch/SUPERGEN/

Faulks to mean how demanding is this identity in relation to other identities. The ‘context’ is the cultural and so historical context that inspires the current definition of citizenship. Finally, Faulks intends as ‘extent’, the extent of the entitlement of the citizen status, that means which are the subjects entitled. So, citizenship is a concept subject to an evolutionary pattern that implies a constant variation of his content (Faulks, 2000).

Assuming that the interest we have in citizenship is related to the present, it is worth nevertheless mentioning that two main philosophical views influenced and still influence the implementation of this idea: liberalism and social democratic political thought according with Prior et al. (1995).

Liberalism showed a view of citizenship reduced to a limited public role in society; in fact the subjective action within society is seen as expressed mainly through the participation to the free market activity. This liberal perspective is complementary to a view of small intervention of the state in citizens’ life and inspired by a political thought that considers equality just as formal equality. Formal equality is traditionally opposed to substantial equality and the former means equality of legal status before the law while the latter means not just equal status in front of the law but also equal economic status. Prior et al. (1995) use the concepts of ‘formal citizenship’ and ‘substantial citizenship’ to indicate that the former means entitlement of rights and duties while the second is, beyond this, entitling the citizen to receive the economic support to realise those rights.

Prior et al. (1995) point out that what is mainly different from the liberal view and distinctive of the social democratic one is the range of rights that entitle citizens to receive many services and economic support by the state that is balanced by the obligation to pay usually progressive income taxes in order to redistribute the wealth within society. Both these different political perspectives showed a lack of ability in enhance political participation beyond the representative system based on regular elections.

Prior et al. (1995, p.95-97) propose the concept of ‘associative democracy’ as a solution that consists in devolving power as much as possible to local authorities that should involve in their decisional process the participation of citizens’ associations.

As a citizenship’s element, ‘political participation’ is a widely explored subject in citizenship’s studies, the concepts of citizenship and participation are strictly related, as Faulks states: “...a key defining characteristic of citizenship, and what differentiates it most from mere subjecthood, is an ethic of participation. Citizenship is an active rather than passive status.” (2000, p.4).

Usually in UK studies about citizenship is recognized as an important contribute to the debate the work of T. H. Marshall. Mashall (in Prior, Stewart and Walsh, 1995, p.7) designed an evolutionary pattern of citizenship based on the assertion that it is a "historically variable concept". Marshall divided the citizenship rights in three categories:

1. "…the first category of legal and civil rights enables the individual citizen to participate freely in the life of the community" (in Prior, Stewart and Walsh, 1995, p.7). These rights were established in seventeen and eighteen centuries at the beginning of the modern state.
2. The second category enables the individual to the right of participating to the public life through the vote and the democratic representation system. This category established in western societies between the nineteenth and the twentieth century.
3. The third category are the social and economic rights that developed in twenty century in the post second war world period through the implementation of the welfare state. These rights are strictly related with the concept of substantial equality.

Marshall wrote his essay in the early period of the post second war world, at that time in western societies the welfare state was growing. He believed in a spontaneous evolution of society toward social equality but as recent history shows such evolution is questioned. Justifying some degree of social equality was and it is a matter of values, but in this respect every attempt to find a shared solution of the debate is likely impossible. Recent studies (Charness and Grosskopf, 2001, O'Connell, 2004, Wilkinson and Pickett, 2011) attempt to approach the problem of equality in a different perspective trying to link economic equality and concepts as wellbeing or happiness in the effort to find any correlation. This is an interesting subject for further research that could lead to a justification of some degree of economic equality substantially different from the philosophical and values based one that is predominant in the political arena. Hypothetically, social equality could be considered as a mean to reduce social conflict, crime and as condition able to facilitate a stronger social integration, being this often related with the barriers created by social status. Against economic equality, the strongest empirical argument is the proved trade-off between efficiency and equality(Okun, 1975). Usually in a system where is present a high level of equality there is less motive to be efficient, but this obviously depends on the degree of equality.

1.2.2 Citizenship, the environment and energy

The concept of citizenship has been recently further elaborated (Smith, 1998, Dobson, 2003) in relation to the environmental problems that society is facing.

Dobson (2003) highlights the evolution of citizenship from the liberal and civic republican tradition toward a post-cosmopolitan one that is currently taking shape. Liberalism is recognized as potentially suitable to facilitate the transition toward a sustainable society, because of the importance that attributes to offering, to individuals and society in general of present and future generations, the ability of choosing between several different options. The theme of intergenerational justice is widely explored by Smith (1998) as well, that consider it as a novelty within the political debate about environmentalism and citizenship.

Dobson (2003) distinguishes between 'environmental citizenship' and 'ecological citizenship'. Environmental citizenship is grounded in the public sphere and is in substance rights and duties attributed on citizens in order to regulate their relation with the environment in the liberal context of the nation state. While ecological citizenship is a post cosmopolitan kind of citizenship, it is not based on the nation state, is non territorial but it is grounded both in the public and private sphere and is originated by citizenship virtues (Dobson 2003).

Dobson (2003) regards education as an important mean to deliver sustainability with the rationale that a substantial change in society is possible just transmitting pro-environmental values to future generations; he opposes this option with the possibility of using incentives and disincentives, and considers education as suitable of delivering a long lasting change.

Devine-Wright (Devine-Wright, 2004, Devine-Wright, 2007) extends the use of the citizenship concept to the field of energy policy, considering the suitability of this to be employed in order to deliver social change toward a low carbon society. He stresses the importance of citizenship as a status that entails responsibilities; these could be enforced but beyond that, they are subjectively perceived and in both cases, they could lead to sustainable behaviours.

Citizenship and pro-environmental behaviours

The concept of citizenship introduced here is an important policy tool to shape individual agency in order to deliver or protect public goods. Public goods such as the environment or security are the by-product of social interaction that is governed by formal rules, laws, and informal personal and social norms (see e.g. Putnam 1993) therefore citizenship both at a formal and at an informal level can be used to encourage or even impose behaviours that are necessary in order to protect public goods. The specific field of study of environmental citizenship is in fact an example of such use of citizenship in order to address environmental problems (Smith 1998, Dobson 2003).

Likely, to deliver the goal of reducing substantially carbon dioxide will be necessary to intervene on both the formal rights and duties of citizenship and on the practice of citizenship, encouraging the exercise of this in a pro-environmental way, e.g. participating to co-operatives of renewable energy. This kind of participation could be seen as an exercise of active ecological citizenship, which could be encouraged by the government establishing a set of rules and incentives which would favour the occurrence of this and other types of citizens' participation in renewable energy production.

1.2.3 Psychological approaches of civic engagement

Rational choice models

Rational choice models assume that before acting citizens evaluate costs and benefits of the considered action and consequently decide engaging in action or not. This model assumes self-interest as the main motive of individual action. Despite it was assumed (Tyler et al., 1986) that material rewards were the main motive of action, this assumption has now changed. Tyler et al. (1986) use the concept of 'self-interest' to represent also non material gains as 'power' and 'prestige'. As Pattie et al. (2003) point out, along the evolution of such theories, non-material personal benefits were considered and in literature emerged the difference between 'selective' and 'collective benefits'. The former category refers to benefits obtained by the individual participating to public life while the latter refers to benefits available to all as result of the public activities developed.

Recently were presented three models of participation that draw on the rational model but including concepts of social psychology.

'General incentives' rational action model

One model was outlined by Whiteley and Seyd and is named 'general incentives' rational action model (Whiteley and Seyd 1996 in Pattie et al., 2003).

In this model participation is a function of costs and benefits and 'expressive attachments' e.g. attachment toward a group or community. This attachment would motivate behaviours on behalf of the community. In this model a "sense of duty" (Pattie et al. 2003) is considered as fostering civic engagement. 'Selective benefits' are included and divided in three categories: 1. 'process benefits', i.e. benefits deriving from the participation to the political process, 2. 'outcome benefits', considered as privatised outcome benefits, 3. 'group benefits' i.e. privatised advantages that benefit groups (Pattie et al., 2003). Also 'collective benefits', i.e. benefits that will be available for the community as a result of the collective action and 'political efficacy', the responsiveness of the political system to the expectation of the individual citizen, are considered as encouraging participation. Finally, this model includes 'social norms', considering these as normative attitudes of family and friends towards participation.

The model is so represented "A= p+ B –C +S +SY +SN +EX

where A is activism, p is efficacy, B is collective benefits, C is cost, S is selective benefits, SY is system benefits, SN is social norms for participation and EX is expressive motives for participation." (Pattie et al. 2003, p.444).

Pattie et al. (2003) test the model against the 'social capital' and 'civic voluntarism' models (for the description of these please see further). The data is part of the Citizen Audit, a large multi-wave survey studying citizenship in the United Kingdom and is from the first study, conducted with over 3400 interviews face to face in 100 local authorities across the country. The authors measured civic engagement as self-reported behaviour and emerged that 'low-cost' kind of involvement (e.g. making a donation to an organization) were more frequent than 'high cost' (e.g. participating to a strike). In order to analyse if different categories of activism were present the authors conducted a principal components analysis and identified three different categories: 'individualistic activism' (e.g. donating money to an organization), 'contact activism' (e.g. contacting a public official), and 'collective activism' (e.g. participating to a public meeting). For the three categories, the models were tested and finally in order to establish if one model could comprise the predictive power of another, encompassing tests were conducted. None of the models could encompass fully the predictive ability of the others; they

therefore resulted complementary in their ability to account for participation. Particularly benefits, resources, participation to other organizations and mobilization showed to be effective in explaining participation.

'Participation Chain' model

The "participation chain" model is proposed by Simmons and Birchall (2003) that base the 'participation chain' model on the 'Mutual Incentives Theory' (MIT). The MIT joins two theories of motivation, one individualistic and the other collectivistic. The 'individualistic' was developed by Homans (1974, in Simmons and Birchall 2003) and assumes that behaviour is motivated by punishments and rewards. The second, 'collectivistic', was instead developed by Sorokin (1954, in Simmons and Birchall 2003) and considers participation as motivated by "three variables:

(i) Shared goals: people express mutual needs that translate into common goals

(ii) Shared values: people feel a sense of duty to participate as an expression of common values

(iii) Sense of community: people identify with and care about other people who either live in the same area or are like them in some respect" (Simmons and Birchall, 2003, p.6).

Individualistic positive incentives considered are: 'benefits' and 'habit' while negative incentives considered are 'costs', 'opportunity costs' and 'satiation'. 'Opportunity costs' are determined by the lost opportunities declined to participate to a single activity. Benefits considered were subdivided in 'external' and 'internal'; 'external' are material/tangible while 'internal' are subjectively perceived.

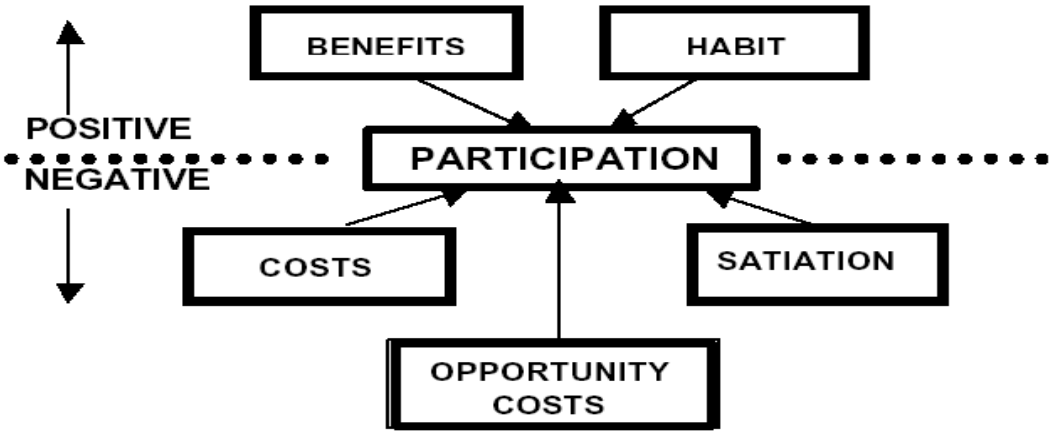

Figure 1 - Individualistic incentives (Simmons and Birchall 2003)

Collectivistic incentives are balanced in MIT by the negative collectivistic incentive 'extensity' that regards the scale of the group considered in which participation develop.

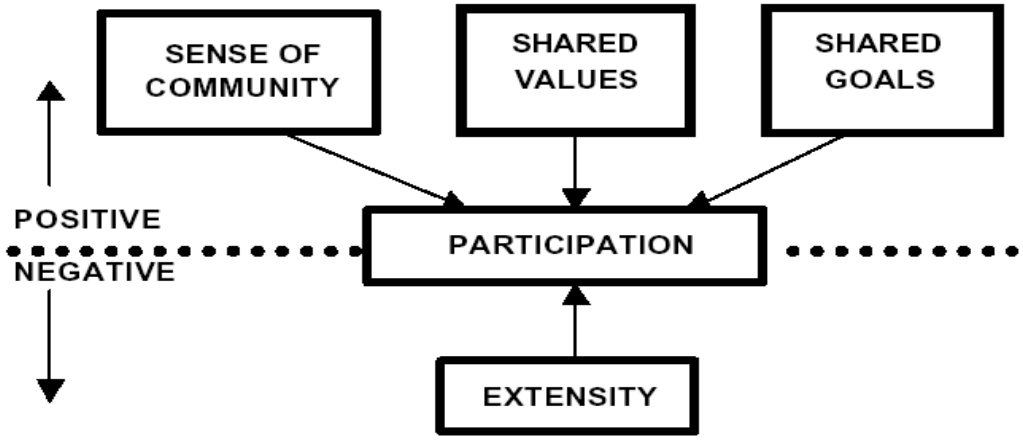

Figure 2 - Collectivistic incentives (Simmons and Birchall 2003)

The MIT is not regarded as sufficient in explaining all the variables involved in determining participation (Simmons and Birchall, 2003, p.13). The authors mention the categorization suggested by Whiteley and Seyd (1996) between incentive based explanations as 'demand-side' models of participation and 'supply-side' models that consider as explicatory variables 'personal resources' and 'mobilisation factors'.

It is noticeable that the importance of personal resources ('personal capabilities') was equally stressed by Stern (2000) as influencing pro-environmental behaviours and support to social movements (Stern et al., 1999).

To give account of these variables, Simmons and Birchall (2003) expand their MIT considering these as the third stage of a multilevel 'participation chain' in which the first

level are ‘resources’, including 1.time, 2.money, 3.skills and 4.confidence; while the second level is ‘mobilisation’ of resources. Mobilisation is constituted by three elements, ‘issues’, opportunities’ and ‘recruitment efforts’. Finally the last stage is motivations (explained by MIT).

Figure 3 - 'Participation chain' (Simmons and Birchall 2003)

‘Issues’ means the importance that the object of participation assumes for participants; a factor which importance has been remarked also by Lowndes et al. (2001). ‘Opportunities’ are instead the presence of good quality opportunities to participate. ‘Recruitment efforts’ are instead passive or active recruitment activities, for passive the authors mean to make public the opportunity to participate without asking directly to potential participants, which is in turn considered the active recruitment.

1. Resources	time	
	money	
	skills	
	confidence	confidence in the ability to participate
		Confidence in personally making a difference
2. Mobilisation	'Issues'	
	Opportunities	
	Recruitment efforts	
3. Motivations Mutual Incentive Theory (MIT)	Individualistic incentives	Positive: benefits, habits
		Negative: costs, opportunity costs, satiation
	Collectivistic incentives	Positive: sense of community, shared values, shared goals
		Negative: extensity

Table 1 - Synoptic table of the 'participation chain'

The authors tested the model in a study regarding participation in the governance of the Co-operative Group (Birchall and Simmons, 2004). The methods used consisted in face to face submission of self-completion questionnaires in the occasion of the convocation of the area committees for the elections: 448 respondents participated. Following this, in depth interviews with committee members and qualitative interviews with key informants were conducted. Finally, a postal survey involved a sample of randomly selected non active members, was carried out whose rate of return was 36% (98 respondents). Members of the Co-operative Group showed to be sensitive to the benefits that the experience of participating provided to them, although mostly internal benefits (e.g. valuable learning experience) were significant for respondents rather than external (e.g. financial reward). Interestingly, collectivistic incentives showed to be predominant on individual benefits: this result is probably related with the co-operative specificity of an organization highly motivated by a certain set of values (social justice, egalitarianism).

Finally, also mobilization showed to be significant in eliciting participation and particularly skills derived from previous experience and face-to-face recruitment efforts.

A rational choice model for environmental collective activism

Lubell (2002) presented a rational model of collective action for environmental activism, in which adapted the collective interest model, a model of collective action derived from the work of Olson (1965). In his model Lubell summarizes in the following equation the factors influencing environmental activism: EV= [(Pg + Pi) * V] – C + B, where EV is environmental activism, the expected value of participation, Pg is group efficacy, Pi is personal efficacy, V is the value of the collective good, C is the selective cost of participation, B is the selective benefit of participation (Lubell, 2002, p.433). The model even if including some psychological variables e.g. personal efficacy, lacks a more comprehensive view of the factors involved in the personal choice to engage in ERBs as e.g. attitudinal factors, or social pressure.

Justice based models

Tyler et al. (1986) outline a 'fairness based psychological model' or 'justice based model'. The authors distinguish between a procedural justice based model and a distributive justice based model, although these models are seen as operating simultaneously. The basic assumption is that citizens judge the fairness of a certain process produced by policies as well as the fairness of its outcomes. In the case of distributive justice, the focus of the judgement is on the outcome of the process. In the case of procedural judgements the evaluation is on the process and this suggests, as Tyler et al. spot, that the government could conserve the support of citizens in presence of a process perceived as fair even if the outcome would penalize citizens: "Similarly a justice based perspective suggest that government might be able to restrict citizens and limit the benefits they receive in a future era of scarcity without losing support from the public if they do so fairly" (Tyler et al.,1986, p.976). Tyler et al. considered data collected in 14 different studies specifying that often the dependent variables were different. In these studies, judgements about gain and loss (rational choice) were compared with justice based evaluations in their influence on political evaluations, voting behaviours and nonvoting behaviours (e.g. writing to a member of the Congress). When the two different categories of judgements were

compared emerged a major importance of justice based judgements in influencing the dependent variables.

Cognitive models

The 'dual pathway model of socio-political participation'.

Stürmer and Kampmeier, (2003, p.108) write "In line with traditional social psychological approaches, one pathway is based on the calculation of costs and benefits; the other is based on collective identification processes." This model therefore considers both incentives and costs and collective identification processes; the incentives considered are individual ones, while for Stürmer and Kampmeier 'community identification' is considered separately as an antecedent of participation. In the case of Simmons and Birchall (2003) instead, community identification is regarded as a collective incentive along with shared values and shared goals, which appear also to be considered antecedents of the participatory process. It seems therefore that the choice of naming these factors as collective incentives is questionable in the light of the rational choice literature (e.g. Whiteley and Seyd 1996) that tends to comprise in the category of incentives or benefits just the acquisition of valued objects as result of the process of participating or of the outcomes of participation.

The social cognitive approach of Albert Bandura

Bandura (2000, 2001, 2002) does not make explicit any model of participation although with his work on self-efficacy contributes indirectly to the debate around the determinants of participatory behaviours. Specifically, tackling the issue of collective agency and collective efficacy (Bandura, 2000), Bandura points to few motives that lead people to participate. Social cognitive theory distinguishes between three different forms of agency 1. personal 2. proxy and 3. collective. Personal agency is the most widely studied by social cognitive theory and regards an individual level, while the 'proxy agency' is used by individuals when they lack the skills or time to develop the required skills or simply time to act on their behalf and in this case they manage to act through a third person. In the case of 'collective agency' people instead feel the need to act together to achieve common goals that require interdependent efforts (Bandura, 2000). At an individual level, perceived self-efficacy is the perception that an individual holds of her suitability to engage successfully in action. While at a collective level, "People's shared beliefs in their

collective power to produce desired results are a key ingredient of collective agency." (Bandura, 2000, p.75). Hence 'perceived collective efficacy' is a group level property and it is not the sum of individual self-efficacy of the group members (Bandura, 2000).

So individual self-efficacy can have a role in deciding to join a group as well as perceived collective efficacy of the group can stimulate attractiveness of the group to non-members that consider the opportunity of joining a group. As Bandura (2000) points out, collective efficacy influences the efforts of members in the group activities and their resilience when faced with a lack of results. It is worth noting how 'confidence' plays an important role in the 'participation chain' (Simmons and Birchall, 2003). 'Confidence' appears to be similar of individual self-efficacy, it is considered within personal resources along with time, money and skills although as Bandura points out, resources could influence self-efficacy or confidence: "Economic conditions, socioeconomic status, and family structure affect behavior through their impact on people's sense of efficacy, aspirations, and affective self-regulatory factors rather than directly." (Bandura, 2000, p.76).

The Value-Belief-Norm theory (VBN) of support for social movements

Stern et al. (1999) outline a theory of support for environmentalist social movements that is an attempt to explain four behaviours: demonstrating, low committed citizenship behaviours, policy support and changes in the personal and private sphere behaviours. The theory presents a casual chain linking 'values' to 'new ecological paradigm' (NEP), 'awareness of consequences' (AC), 'ascription of responsibilities' (AR) and finally 'normative beliefs', these norms should imply the adoption of ERBs. Each of these factors influences the following ones down the chain. Personal norms are ultimately influenced by the awareness of adverse consequences (AC) on objects that people value and by the belief that personal behaviour can reduce this threat (AR).

Stern (2000) pointed out as personal capabilities in addition to attitudes play a fundamental role in shaping pro-environmental behaviours; this was suggested also by Stern et al. (1999), i.e. 'demonstrating' was not explained by the VBN theory but it was found positively related with age and income. The VBN theory is therefore a useful insight to account cognitive processes that concur in motivating participatory behaviours, although it doesn't seem sufficient to explain entirely these behaviours.

Social capital

Putnam (1993) was moved by investigating the positive relation between social capital and democracy, economic development and societal well-being. The social capital theory provides some interesting insights on the relation between social structure and civic engagement. Putnam considers in an historical perspective modern societies and their social culture; he compares societies ruled by vertical organizations (scarcely democratic) in which social trust and social networks are weak, with societies in which are well developed horizontal organizations, democratic organizations, as e.g. mass parties, co-operatives, associations. Putnam (1993) regards self-interest and altruism as just apparently opposite, he thinks that self-interest "enlightened" (Putnam, 1993, p.88) motivates people to pursue collective benefits. It seems that this convergence of individual and collective interests is common to the Bandura's description of collective agency (Bandura, 2000) and it seems to be accounted for in the 'participation chain' of Simmons and Birchall (2003) when, between collective incentives, we find 'shared goals'. Putnam (1993) seems to sustain a mutual reinforcement between 'interaction', 'trust' and 'reciprocity' but does not provide a specific theory of civic engagement that could explain further the presence or the lack of such social marks. Finally his historical perspective leads Putnam to sustain that civic community "has deep historical roots" (Putnam, 1993, p.183) sustaining that change is a very slow process that does not occur for a mere reformist willing.

Civic voluntarism, a socio-economic approach

Civic voluntarism is a socio-economic model of participation which holds that "...the better educated, more affluent and more middle class people are, the more likely they are to participate" (Pattie et al., 2003, p.445).

SES socio-economic status (education, income and occupation) is regarded as a well proven factor influencing participation (Verba et al., 1995): building on this evidence, Brady et al. (1995) propose to substitute SES with a resource model that include 'time', (availability of free time), 'civic skills', (communications and organizational capacities), 'money' (household income) and finally psychological engagement in politics, an attitudinal measure. In their opinion these resources could refine the predictive efficacy of SES while maintaining the same rationale.

Finally in this model ‘mobilisation’ is considered an important factor determining participation; particularly, asking to participate and stressing the importance of participation are considered the main mobilisation actions to foster participation. Within these variables, Brady et al. (1995) stress especially the importance of resources that compared with psychological engagement are more easily measurable and therefore less disputable in the academic debate.

Discursive psychology approach: citizenship in practice

Barnes et al. (2004) use the approach of discursive psychology to study citizens’ claims on the specific matter of new travellers. Despite the specific case, this approach uses the tools of discursive psychology, content analysis, to underline how citizens build their identity in relation to their community and to the places where they live. Citizens represent to themselves and to others their identity and the identities of others in order to claim rights and to achieve goals. The apparent objective of citizens’ action is the pursuing of personal or group interests, but the discursive psychology approach refuses to investigate how cognitive processes shape interests and consequent actions, in fact, this approach rejects the assumption that discourse is a mirror of cognitive processes (Potter, 1996).

Final remarks about the cognitive models of civic engagement considered

A few remarks can be drawn after the exposed review of theories of civic engagement:

1. Most authors (Pattie et al., 2003, Simmons and Birchall, 2003, Stürmer and Kampmeier, 2003, Bandura, 2000, Lubell, 2002, Putnam, 1993) consider incentives or interests as motivating participation and some of them (Pattie et al., 2003, Simmons and Birchall, 2003, Lubell, 2002) highlight the concourse of individual (or selective) incentives and collectivistic incentives in determining participation.
2. Processes of identification or attachment toward a group or community that could benefit from civic engagement were considered by several authors as encouraging participation (Pattie et al., 2003, Simmons and Birchall, 2003, Stürmer and Kampmeier, 2003).
3. Perceived efficacy is identified as fostering participation (Bandura, 2000, Simmons and Birchall, 2003, Lubell, 2002).

4. Personal resources are considered by several authors (Verba et al., 1995, Simmons and Birchall, 2003, Stern, 2000), as influencing directly and positively participation or indirectly through perceived efficacy (Bandura, 2000).
5. 'Responsibility' is included in two models: in the 'value-belief-norm theory' (Stern et al., 1999) and in the 'general incentives' rational action model (Pattie et al., 2003).

1.2.4 Citizens' participation in the context of sustainable energy development

Considering participation in the context of renewable energy policy and social acceptability of renewable energy development is necessary to draw a line between what could be considered a passive and an active involvement.

A passive involvement that could be resumed in pure acceptability of an energy policy and specifically e.g. acceptability of new renewable developments across the country, acceptability of local installations of renewable generators. Such passive involvement is obviously very different from every active engagement in promoting renewables; therefore, it is likely that it would be produced by different determinants. In the case of acceptability or passive involvement, a sense of 'responsibility' toward the local and national community and future generations, perceived procedural justice of the government's policy and perceived distributive justice outcomes could play a role in determining consensus toward an energy policy promoting change but also presenting some possible disadvantages to citizens.

Sense of responsibility could be fostered by a sense of identification or attachment toward community both locally and nationally, as Stürmer and Kampmeier (2003, p.107) point out about 'collective decisions': "Group members perceive these decisions and norms as socially valid and meaningful. This, in turn, fosters an inner commitment to act accordingly and behave as a "good" (i.e. responsible) group member."

It is interesting to note that 'personal resources' (such as time, income, skills, education) could play a different role with regards to passive acceptability rather than in active engagement, in fact a passive acceptance of policies could be related with low incomes and low education: people with low education or less skills, possibly could refrain from elaborating a personal opinion and accept passively the government's action for sense of responsibility toward the nation or simply for lack of confidence.

The active engagement in organizations, associations or co-operative supporting actively renewable energy developments may have a partly different set of determinants. If identification processes are surely still important, other determinants come into play, as individual incentives, self-efficacy, affluence of personal resources (income, skills, education, and time). At the same time, mobilisation activated by local or national authorities or groups interested in expanding their structure, could play a role in fostering active participation.

1.2.5 Environmentally responsible behaviour and its determinants

Environmentally responsible behaviour (ERB) is used in literature as the other label, 'pro-environmental behaviour' to mean a behaviour that consciously limits negative consequences on the environment (Kollmuss and Agyeman, 2002). The label 'environmental significant behaviour' instead does not have a positive or negative connotation: "Environmentally significant behaviour can reasonably be defined by its impact: the extent to which it changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself." (Stern, 2000, p.408).

The literature on environmental responsible behaviour is certainly vast but still lacks agreement about the determinants of ERBs. As Barr (2003) points out there are different factors influencing ERBs depending on the behaviour in itself. De Young (2000, p.510) holds the same view stating that "Empirical evidence has emerged supporting the idea that ERB has multiple antecedents" and that different behaviours may have different determinants. Anyway, these assumptions do not express the impossibility of considering for a single behaviour, or for a set of similar behaviours, a group of factors that influence them and that therefore could be considered by policymakers to influence positively ERBs. Reviewing literature on environmental responsible behaviours, it seems clear that some early assumptions were rejected by the empirical tests so far conducted and particularly that simply a widespread information on environmental matters could drive toward ERB (Barr, 2003, Kollmuss and Agyeman, 2002) or that altruism based models (Stern et al., 1993) could explain why ERBs take place instead of self-interest motivated behaviours.

It was suggested (Stern, 2000, Barr, 2003) that situational barriers play an important role in preventing the occurrence of ERBs; particularly Barr (2003) shows how in relation to a behaviour like recycling, in which situational factors play an important role, as e.g.

facilities available and collection schemes, the presence of these has an important role in determining ERBs while in a part of the same study regarding the same sample, interviewed this time about waste minimization, a behaviour that does not require to be fulfilled specific facilities, emerged that environmental values and a sense of responsibility toward the environment (named 'environmental citizenship') had an important role along with past personal experiences and demographic variables in fostering the considered behaviour.

If barriers play a role, this could mean that generally people would avoid behaviours that imply a great deal of personal sacrifice, although some highly committed environmentalists could carry them out anyway, most people could imply in their decision to engage in ERBs a personal assessment of costs and benefits of every single behaviour before engaging in each of them (Diekmann and Preisendorfer, 2003).

Diekmann and Preisendörfer (2003) integrate the rational choice model with 'environmental attitude' research; specifically the authors studied the influence of attitudes in high cost versus low-cost situations and proposed the "low-cost hypothesis": "...environmental concern influences ecological behaviour primarily in situations and under conditions connected with low-costs and little inconvenience for individual actors. The lower the pressure of costs in a situation, the easier it is for actors to transform their attitudes into corresponding behavior. If costs are high, environmental concern does not help overcome one's reservations, and there will be few or no effects of environmental attitudes." (Diekmann and Preisendorfer, 2003, p.443). Costs in the low-cost hypothesis are not considered only of financial nature. Considering rational choice models, Diekmann and Preisendörfer (2003) criticize their ability to explain individual choice in low-cost situations; the authors sustain that the model does work to explain individual choice in high cost situations only, but below a certain cost threshold, attitudes have a major influence on behaviour. The authors realized 2,307 face -to -face interviews, using a questionnaire, each of one hour, on two different random samples of citizens living in private households and older than 17 years, in the East and the West Germany, these were respectively 1,212 and 1,095. Questions regarded self-reported behaviours of four areas of environmental significant behaviours: recycling, shopping, energy and water saving, and mobility/transportation; questions concerned also environmental attitudes, ecological knowledge and socio-demographic characteristics. The survey was stratified through a weighting procedure considering that 80% of Germans live in the West and 20% in the East. To measure environmental concern, 9 5-point Likert scale items were used. The

low-cost hypothesis was tested with two different methods. The first test used a comparison between different behaviours to measure the effect of environmental concern on them. Behaviours were categorized in low-cost or high-cost depending on the assumption that the less is a behaviour occurring the higher its cost (Diekmann and Preisendorfer, 2003). However, the authors recognized that the frequency of a certain behaviour could vary depending on the perceived efficacy of the behaviour (not of the agent) and admitted that this variable may have distorted their cost evaluation. Statistical analysis, Pearson and Gamma, bivariate correlations and the logit effects, the effects of environmental concern after controlling six socio-demographic variables (West/East Germany, gender, age, schooling, income, political left/right orientation) were carried out; values of correlations were dramatically higher for low-cost behaviours confirming the hypothesis. The second test procedure divided respondents in low-costs and high-costs groups in respect of specific behaviours. The groups were determined on the basis of "auxiliary assumptions" (Diekmann and Preisendorfer, 2003), these are made on the basis of situational circumstances, as e.g. the presence of recycling schemes for some respondents. For the six behavioural items considered, Pearson and Gamma correlations and logit effects were much higher for the low-cost group confirming the hypothesis. Of course, the methods employed by the authors could have influenced the results; it appears to be criticisable, both the assumption of frequency as related with costs, (even if some degree of correlation is likely to exist) and the categorization of behaviours in low-cost or high cost depending on situational factors, despite this, their assumption of a limited influence of attitudes in high cost situation is shared by other authors (e.g. Stern 2000).

As noted by several authors (Stern, 2000, Kollmuss and Agyeman, 2002) attitudes toward ERBs seem to influence the intention of engaging in such behaviours when it is not required a high personal cost (in terms of money and/or time). It is therefore interesting to consider the approach of Kaplan (2000) and De Young (2000) who hold the view that altruism alone can't explain ERBs especially in the long run; these authors share the perspective that self-interest is a major drive for human behaviour and that despite altruism could offer a starting motivation in engaging in an ERB, in the long term self-interest, that De Young (De Young, 2000, p.515) identifies in the form of "intrinsic satisfaction", would keep a subject actively committed to a certain behaviour.

De Young (2000) points that in 9 studies carried out between 1990 and 1999 in which respondents were asked to rate their satisfaction (using a 5-point Likert scale) in relation

to a range of different activities, four categories were identified using factor analysis: satisfaction derived from 1. behavioural competence, 2. frugal, thoughtful consumption, 3. participation in maintaining the community, 4. from luxuries. The last category was initially included to check for construct validity (De Young, 2000), but then resulted that people indicated largely also these behaviours as providing satisfaction (e.g. “having new items to try, evaluate and buy”, De Young, p.519).

De Young holds the opinion that competence is a key aspect of intrinsic satisfaction: “People find unpleasant and thus avoid situations in which they cannot advance or utilize their competence.” (De Young, 2000, p.521). The author suggests that participation and frugality could be ultimately considered as behavioural competencies, stressing that for participation is considered important the sense of achievement in producing a result as a consequence of participation.

Final remarks about the literature on environmentally responsible behaviour

The following conclusions were drawn from the literature reviewed on ERBs:

1. ERBs have different determinants depending on the kind of behaviour that we consider.
2. Different behaviours could share the same determinants but the relative power to influence behaviours would vary from a kind of behaviour to another.
3. Information and environmental awareness are not able alone to predict ERB.
4. Attitudes are not able, alone to predict ERBs, but they show more predictive power when the considered behaviours do not suffer from situational barriers and strong disadvantages (e.g. money and time costs).
5. ‘Intrinsic satisfaction’ in terms of personal benefits (e.g. exercise and improvement of personal competences), could be considered a motive for engaging in ERBs.

1.3 The case of co-operatives, producers of green electricity

Owen and Hunt (2004) consider the involvement of communities an important step toward implementing the goal of carbon dioxide reduction set by the government. The co-operative scheme is discussed by Owen and Hunt that provide a review of the case with regards to the UK context. Owen and Hunt (2004, p.5) highlight four reasons for local ownership of renewable energy developments:

1. “Local ownership creates local dialogue and acceptance”
2. “Local ownership raises public awareness and makes sustainable development understandable”
3. “Local ownership solves problems and conflicts”
4. “Local ownership gives people the opportunity to act for sustainable development”

Owen and Hunt consider also the main barriers currently present to make this option easily achievable for communities through the country and identify ‘complexity’ as the major barrier. This complexity is expressed by several problems: raising finance is difficult, because the financial support, if present, is not easily identifiable, due to a plethora of schemes; further, securing planning permission is hard to achieve and finally the amount of upfront funding needed is a major issue. All these difficulties make the process costly and time consuming.

The importance of community involvement in renewable energy development is also considered by Toke (2002) who uses a rational choice model of collective action, first outlined by Olson (1965), to explain why co-operative schemes of wind power became well developed in Denmark, while wind power met difficulties in its expansion in the United Kingdom. His thesis affirms that the co-operative scheme was advantaged by policy makers in Denmark, while in the UK was more convenient for large commercial companies to invest in wind power; this difference lead to a strong local opposition to wind farms in the UK, due to private interest schemes that did not involve local people, while collective co-operative schemes were successful in Denmark. When in the same social context of Denmark, in the last few years, individual local ownership of wind farms expanded, an increase in criticism toward wind farm developments was observed that was attributed to the lack of collective local ownership (Toke, 2002).

The rational choice model elected by Toke, explains wind farm protests as an example of ‘free riders’, individuals that have a positive attitude toward the environment and renewable energy but that do not want to bear the costs (e.g. noise and visual impact) of wind farms even if at the same time they are willing to ‘free ride’ the benefits (e.g. a less polluted environment) when the wind farms are placed in other locations. The author holds that the co-operative scheme showed to be effective in making possible a wider local acceptance of wind developments balancing for individuals the costs of wind farms (noise and visual impact) with the advantages of local ownership (economic incentives

and other selective incentives). Hence suggesting a solution, at least in the specific case of wind farms, for the "value action gap"(Kollmuss and Agyeman, 2002).

Attitudes toward local ownership and local involvement was the object of a research conducted in South Wales at the Awel Aman Tawe development (Devine-Wright, 2005b). 259 structured interviews were conducted with local people randomly selected from 14 villages close to the wind development in April and May 2000. 167 of the initial interviewees participated to follow-up interviews in February and March 2001. Interviews therefore were carried out before and afterwards a process of participation that involved the local community with several initiatives of consultation, discussions, trips to the wind farm, public meetings and others. There was not a significate change in support for local partnership and local ownership before and after the process. Local partnership received a strong support (85-88%) as putting back the profits of wind farms into the local community (84-87%), while still largely majority but with a lower proportion (53-51%) was the theme of local ownership.

1.4 Proposed framework of participation in co-operatives of green electricity

The concepts of 'citizenship' and 'participation' are strictly related (Faulks, 2000), as earlier recalled (in section 1.2.1). .

While participation is also associated to the concept of 'co-operation' by Birchall and Simmons (2004) who adopt for 'participation' the definition of 'co-operation' given by Argyle (1991, p.4)[2] : "acting together in a co-ordinated way at work, leisure, or in social relationships, in the pursuit of shared goals, the enjoyment of the joint activity, or simply furthering the relationship".

It is evident that acting together in a coordinated way in the pursuit of shared goals can be considered an ERB if the shared goal is limiting negative consequences on the environment. This is the case of participating in co-operatives of green electricity;

[2] This definition was originally proposed by Argyle (1991) for 'co-operation' but it is accepted by Birchall and Simmons to define participation.

therefore, the object of this research lies into the overlap of different concepts (ERB and participation as a feature of citizenship).

In order to further the understanding of which factors might influence specifically this type of participation, it was outlined a provisional model including several factors suitable to affect participation in co-operatives of green electricity based on this first strand of literature review. The following categorization (figure 4) and list of factors were not conceived with the aim to be exhaustive but rather with the purpose of setting the basis for the first stage of data collection, (i.e. a qualitative study whose details are recalled in chapter 2).

As showed in figure 4, three categories of factors are identified as influencing participation according with the categorization proposed by Stern (2000). The categories are ‘contextual factors’, ‘personal capabilities’ and ‘psychological factors’. The factors are presented in relation to the co-operative case and they appear in the list following figure 4.

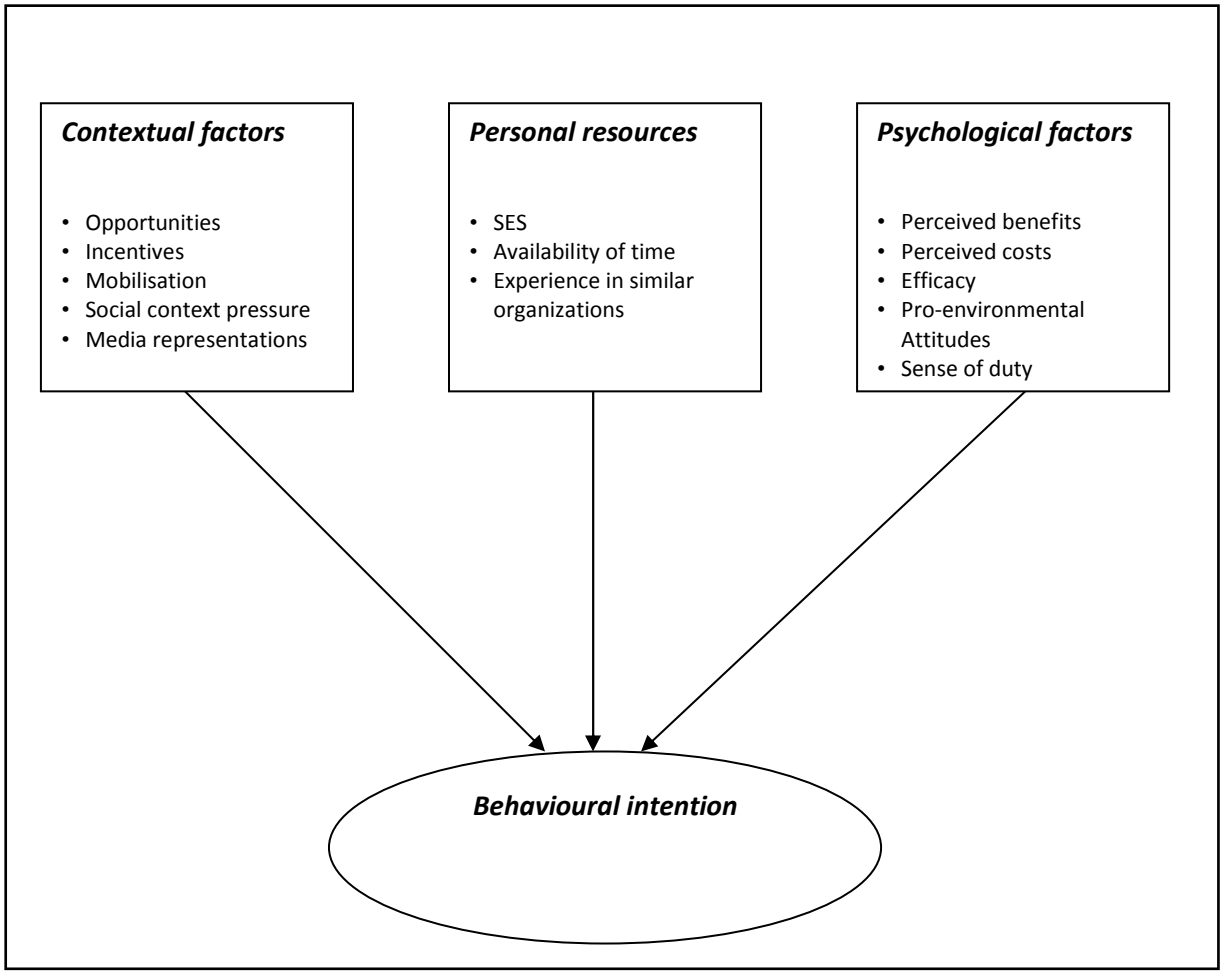

Figure 4 - Proposed factors influencing the behavioural intention of participation in wind farm co-operatives

List of factors influencing participation in energy co-operatives included in the model proposed

- **<u>Psychological factors</u>**
  - **Perceived benefits**
    - *Perceived collective benefits*
      - Perceived outcome benefits
        - shared goals
          - Environmental
          - Social justice
          - community economic status improvement
    - *Perceived selective benefits*
      - Perceived process benefits
        - Meeting likeminded people

- ♦ Intrinsic satisfaction of participating
- ♦ Sense of contributing to a just aim

- Perceived outcome benefits
  - ♦ Development of competences/ skills
  - ♦ Acquisition of new competences/ skills
  - ♦ Economic revenue

➢ **Perceived Costs**

- *Perceived collective costs*
  - Perceived Outcome costs
    - ♦ Perceived negative outcome for the community
      - ➢ visual impact of wind farms
      - ➢ noise
- *Perceived selective costs*
  - Economic cost
  - Time cost

➢ **Efficacy**

- Perceived group efficacy
- Individual perceived self-efficacy

➢ **VBN Value-Belief-Norm theory**

- Values
- New ecological paradigm (NEP)
- Awareness of consequences (AC)
- Ascription of responsibility (AR)
- Normative beliefs

➢ **Sense of duty**

➢ **Perceived sense of community**

❖ **<u>Personal resources</u>**

➢ **SES socio-economic status**

➢ **Availability of time**

➢ **Experience in similar organizations**

❖ **<u>Contextual factors</u>**

➢ **Presence and awareness of opportunities to engage in the specific behaviour**

- **mobilisation factors**
  - oral face to face request
  - media campaigns
  - postal leaflets
  - postal invitation to join a specific initiative
- **social context pressure**
  - Family
  - Friends
  - local opinion leaders
- **media representations**

The interaction of the proposed factors in determining participation in wind farm co-operatives

The influence of costs and benefits on participatory behaviours and ERBs is widely acknowledged (e.g. Whiteley and Seyd 1996, Stern 2000, Diekmann and Preisendörfer 2003, Simmons and Birchall 2003). Therefore in this model 'perceived costs' and 'perceived benefits', were included as psychological variables according with Stern (2000). The adoption of the labels 'perceived costs' and 'perceived benefits' instead of 'costs' and 'incentives' underline the assumption that what ultimately influence the behavioural intention is neither an objective 'cost' nor an objective 'benefit', but rather their subjective perception. This specification albeit not clearly stated is assumed in the 'general incentives' model of Whiteley and Seyd (Pattie et al., 2003). In fact all the measures presented of costs and benefits[3] are subjective measures collected through a questionnaire survey (Pattie et al., 2003); further, we can find in the article the use of the label "perceived collective benefits" (Pattie et al.2003, p.450). This in contrast with Diekmann and Preisendörfer (2003) where the authors make explicit that they refrained from collecting a self-reported measure of costs in their survey in order to avoid subjective assessments. (2003)

Specific perceived costs and benefits as they emerged from the literature review on participatory behaviours and ERBs were included in the model; they were elected in

[3] The labels 'benefits' and 'incentives' are used by Pattie et al. (2003) as synonymous and the literature reviewed do not make clear any distinction. Therefore, they will be considered in this document as synonymous.

consideration of the object of research, participation in co-operatives of renewable energy and appear in the list presented.

‘Collective outcome benefits’ are in this model ‘shared goals’, this is a collective incentive proposed by Birchall and Simmons (2004). In this specific case, co-operatives of renewable energy, shared goals could comprise environmental, social justice and community goals as those listed.

Within ‘selective benefits’, are included ‘process’ and ‘outcome’ benefits; process benefits are a result of participation while outcome benefits derive from the outcomes of participating.

Within the selective process benefits group, ‘meeting likeminded people’ (Lubell, 2002), ‘intrinsic satisfaction’ (De Young, 2000), and ‘sense of contributing to a just aim’ were included as they emerged from the literature review and appeared to be relevant in this case. Specifically, ‘meeting likeminded people’ is a benefit that appear to be realistically achievable in an organization like a co-operative of green electricity, in fact, this is aimed by clear pro-environmental and social goals that are suitable to attract people sharing common values. De Young (2000)do not clearly define ‘intrinsic satisfaction’ as an incentive but labels it as “self-interest” (De Young, 2000, p.516) and as a motive to engage in environmentally responsible behaviours; therefore it seems possible to include it in the category of selective process benefits, particularly because De Young makes explicit reference to intrinsic satisfaction that derives from participating. ‘Sense of contributing to a just aim’ is not explicitly stated in the literature review, although Lubell (2002) and Stürmer and Kampmeier (2003) refer to a psychological benefit deriving from value oriented participation. In the specific case of co-operative the joint values of ‘equality’ with sustainability make likely that some participants might get from the process of participating the benefit derived by manifesting such values.

The ‘Outcome selective benefits’ included are ‘development of competences/ skills’, ‘acquisition of new competences/ skills’ and ‘economic revenue’. The first two are considered by De Young (2000) a motive to engage in ERBs, while the third one is related to the nature of the co-operative scheme, that is ultimately an economic actor producing revenue on behalf of its members. The development of competences are a benefit that is suitable to be ripped by activists, in fact their involvement would imply the exercise of skills or competences in the process of participating.

‘Perceived costs’ comprise ‘collective’ and ‘selective costs’: collective costs included are ‘visual impact of wind farms’ and ‘noise’, these emerge clearly from literature about wind farms opposition (Toke, 2002); while selective costs, ‘economic cost’ and ‘time cost’ are intuitively related with the type of participation considered, in fact the former is based on the necessity to buy shares in order to become member of a co-operative while the second would vary depending on the role of the member, if the role is passive, it could be a low-cost related with gathering and assessing information about the co-operative investment, while if the member would become an activist, the time cost could be much higher.

Beyond perceived costs and benefits, other psychological factors are widely considered in literature about ERBs and participation.

Perceived ‘efficacy’ is part of numerous theoretical models of participation, (e.g., Bandura, 2000, Cohen et al., 2001, Lubell, 2002). It was considered here both perceived collective efficacy (e.g. Bandura 2000, Lubell 2002,) and perceived self-efficacy (e.g. Bandura 2000, Cohen et al. 2001). In the context of co-operatives of renewable energy a subject could perceive both the collective efficacy of the co-operative initiative to succeed and her personal efficacy to participate to the co-operative, particularly the ability to understand the aims and advantages of the co-operative, before engaging in participation, or her ability to participate actively taking part in specific activities (e.g. attending meeting, reading reports etc.).

Attitudes are broadly included in theoretical models of ERBs (Stern, 2000, Kollmuss and Agyeman, 2002). Particularly the ‘value-belief-norm’ theory of support for social movements (Stern et al., 1999) seems to fit the case of co-operatives of renewable energy, because of the pro-environmental aims set by the co-operative, therefore it seemed appropriate to include the theory in the model proposed.

Beyond attitudes and efficacy, perceived costs and benefits, two other psychological factors were included because appeared to be relevant in the context of co-operatives of renewable energy, these are: ‘sense of duty’ (Pattie et al., 2003) and ‘perceived sense of community’(Simmons and Birchall, 2003, Stürmer and Kampmeier, 2003). ‘Sense of duty’ means the sense of responsibility toward the community and in our specific case it could be interesting to measure this as referred toward both the local and the national community, in fact although the co-operative would be a local initiative, the benefits go beyond the local community as its production of electricity would feed the national grid.

‘Perceived sense of community’ refers to processes of identification with the local community, in fact these could foster personal commitment in local initiatives (Stürmer and Kampmeier, 2003). The co-operative initiative would be aimed to rise participation locally therefore these processes are relevant.

‘Personal capabilities’ (Stern, 2000), or ‘resources’ (Birchall and Simmons, 2004, Verba et al., 1995) are included as relevant factors in both domains of theories of environmentally responsible behaviours and theories of participation.

Being SES considered an established factor influencing participation (Brady et al. 1995) it seems opportune to include it in this model: SES is usually measured in its three components, income, education, occupation. Beyond SES ‘skills’ or ‘civic skills’ could be included, but being difficult to assess communicational and organization skills, and possibly inappropriate in this context (Verba et al., 1995, use them as a factor influencing political participation), it appears as more appropriate to consider them as Birchall and Simmons (2004) did, i.e. taking in account previous experience in similar organisations. For previous experience in similar organizations in this specific case, it makes sense thinking in previous membership or activism in other co-operatives, in pro-environmental organizations (e.g. Friends of Earth) or left-wing parties (e.g. Co-operative party or Labour party). Finally, availability of time, was included according with Verba et al. (1995) and Birchall and Simmons (2004), in fact it is evident that an active commitment would require it.

Further, ‘Contextual factors’ were included following the categorization of Stern(Stern, 2000, p. 421). These are: ‘social context pressure’ (Pattie et al., 2003), the presence of ‘opportunities’, ‘mobilisation factors’ and ‘media representations’ (Birchall and Simmons, 2004).

‘Social context pressure’ refers to the opinions of close people about participating, Pattie et al. (2003, p. 453) defined them generically as “...people whose opinions were important to them...” (‘them’ is referred to respondents), with this, opening to subjects that are not only within the circle of family and friends of the interviewees as e.g. opinion leaders.

The presence of ‘opportunities’ is a factor included by Birchall and Simmons (2004) within their mobilisation factors. Unfortunately Simmons and Birchall (2004) do not define clearly what they mean for opportunities, even though they seem to refer both to the presence of opportunities and to the attractiveness of them. It seems that the attractiveness of opportunities is linked with their nature and the benefits or costs entailed

in them, therefore referable ultimately to other factors. While the presence of opportunity and the awareness of this presence are intuitively necessary to have any sort of participation; Lowndes et al. (2001, p.451) highlighted the importance of awareness of opportunities as a factor influencing participation in local government.

“Mobilisation attempts” (Simmons and Birchall, 2004, p.14) are considered important, particularly Simmons and Birchall (2004) distinguish between direct requests, (face to face request), in opposition to indirect requests, (postal etc.).

Finally, it was included ‘media representations’, because wind developments are controversial and often rising local and national debate, hence is possible to hypothesize that negative or positive media representations could influence citizens in participate to the co-operative scheme.

1.5 Literature review update

As recalled earlier (in section 1.2), the following part of the chapter was elaborated after the completion of the analysis of the qualitative study, in order to take into account the then newer literature before proceeding to create the questionnaire for the quantitative study.

1.5.1 Introduction

This update was conducted mostly in 2009 and it had the main objective of both including studies that might have been previously unwillingly missed and reviewing more recently published studies, specifically dedicated to ‘social acceptability of wind farms’, ‘community benefits’ and ‘wind farm co-operatives’.

This section has been divided in sections which refer to different factors that were found to lead to wind farm opposition or support.

In the final paragraph, how this literature relates to this research project has been discussed.

1.5.2 Opposition to wind energy

While wind energy on a UK national scale is a popular form of energy production, with a level of support of 82% registered in a 2010 national survey (Spence et al., 2010) the

same support might be weaker locally in specific areas where developments are proposed (Devine-Wright, 2005a).

Local opposition has been explained with an emphasis on various types of factors which are considered the cause of these negative attitudes (see e.g. Devine-Wright, 2005a). These, echoing the classification of factors influencing environmentally significant behaviours proposed by Stern (2000) and adapted by Devine-Wright (2008) could be classified in three categories: 1, 'attitudinal factors' comprising perceived local costs and benefits of local relevance, perceived non-local costs and benefits, place attachment and environmental attitudes; 2, 'personal factors', comprising knowledge about wind energy, affluence/deprivation and proximity of residence to the wind farm; 3, 'contextual factors' comprising procedural fairness, trust towards the proponents and participation.

The choice of which category should comprise each factor is in some extent contentious. Ultimately most of the factors could be considered attitudinal, in the sense that their perception could be subjective i.e. different subjects could held different attitudes with regards to objective factors such as the information distributed by the developer to the local residents. Even aside of 'the attitudinal factors' category, other doubts might arise, and a single factor, e.g. 'proximity of residence to wind farm' could be considered as belonging to the 'contextual factors' category instead of the 'personal factors' category. Therefore the classification here proposed might differ in some extent to those proposed by Stern (2000) and Devine-Wright (2008) not only for the choice of the single factors, but also for the collocation of a factor in a category instead of another.

Perceived local impacts

The factors which matter locally seem to explain much of the opposition, as Agertbosch et al. (2009, p.400) state: "The mismatch between the local common interest and the external private or global environmental interest contributes to the risk of local social resistance." In fact the environmental benefits of wind farms accrue globally, (i.e. diminished carbon emissions), while the economic advantage is entirely or mainly delivered outside of the local community, (to developers), therefore the local community could be considered as the party which bears the impact of the development on their local environment without substantial benefits.

Cass et al. (2010) research seems to confirm this. They run a questionnaire survey of local residents living close to ten renewable energy projects in the UK. The data of their survey,

which had 2911 respondents, showed a strong positive correlation between perceived benefits or drawbacks personally and project support (+0.681, p<0.000), and between perceived benefits or drawbacks of the project for the local area and project support (+0.674, p<0.000). Therefore the more respondents perceived benefits personally or for the local area the more they were likely to offer their support. Perceived local and personal benefits and impacts were also highly correlated (+0.85). The authors (Cass et al., 2010) also carried out a linear multiple regression analysis to compare the effect of benefits/impacts with other variables suitable to influence project support, such as attitudes to the technology and perceptions of trust. They found that the perception of benefits was the single most important determinant of project support which preceded for importance 'general beliefs about the technology sector', 'beliefs about the developer's engagement practices', 'trust in the developer' and 'perceived fairness of the planning procedures'. The beta coefficient for 'perceived personal benefits/drawbacks' was 0.281; t = 10.283; p < 0.000 (F =240.073; df 13; p < 0.000).

1.5.3 Attitudinal factors

Attitudinal factors comprise the perceived costs and benefits, local and non-local, the perceived trust towards the proponents of the wind farm, place attachment and environmental attitudes. All these factors are comprised within the classification proposed by Devine-Wright (2008) within the 'attitudinal factors' category. Nevertheless here it was attempted a detailed sub-classification of the perceived local and non-local impacts which seems not having being previously compiled in literature. In so doing, some minor impacts, which are less or non-reported, might have been omitted or overlooked.

Perceived local costs and benefits

These factors seem to be mainly (but possibly not only): the economic local impact of the wind farm, the visual impact, the sound impact and related noise pollution and the perceived impact on the health of the local population.

Local economic factors and community benefits

The economic interest is the main drive of wind energy developers but it can also influence the local community's opinion on the development.

A number of different local economic issues can affect residents' opinions: on one side fears about the negative impact of the development on local property prices, the fear that the development might affect the local tourism industry, if present, on the other side the belief that the local wind farm could bring some advantages such as local jobs or community benefits which, depending on the definition, could consist in donations or revenue to the community provided by the developer,. Finally, also local ownership schemes can be considered an economic factor suitable to influence the attitude of the local community because it allows the local residents to join the ownership of the wind farm and therefore to benefit from the revenue of the development.

In this regard, Agterbosch et al. (2009) conducted a multiple case study survey in the Netherlands using semi-structured interviews and content analysis of written material. They focused on the municipality of Zeewolde in the province of Flevoland, which alone accounts for 40% of Dutch wind energy. The authors interviewed stakeholders involved in wind farm projects owned either by the 'regional energy distributor', (a large private business), or small investors, (i.e. mainly farmers in this study). Agterbosch et al. concluded that the presence of a shared economic interest between the developer and the local community, along with procedural fairness, can substantially diminish local opposition.

Also Jones and Eiser (2009) researched social acceptability of wind farms. Their study regarded four proposed wind farms in four sub-urban areas of Sheffield (England), adjacent to the chosen sites (target areas) and in four comparison areas in similarly sub-urban areas of Sheffield, which were at a greater distance from the chosen wind farm sites. 1200 questionnaires were distributed on a door to door basis and 843 were returned. Several hierarchical regression analyses were carried out which analysed the influence of groups of variables on support/opposition, whilst controlling for 'general attitude to wind energy'; one of these groups were economic variables: four of them were significantly related to support in the target areas: 'general economic benefit' (0.30), 'community trust fund' (0.10), 'opportunity to invest' (0.13), 'cheaper electricity' (0.13) while 'general attitude to wind' was the most influential (0.32). In the comparison areas instead, the only two significant variables in addition to 'general attitude to wind' (0.50) are 'general economic benefit' (0.15) and 'employment opportunity' (0.09). Therefore from this regression analysis it appears that 'general attitude to wind' is the most influential variable

in determining support/opposition but in the case of the target areas, this is very closely followed by 'general economic benefit' which show that respondents in the target areas are sensitive to the possible economic advantages deriving from the proposed wind farms. In the case of the comparison areas instead, the difference in the standardised beta coefficients between 'general attitude to wind' and the economic variables show that respondents are less influenced by these in their support for the proposed wind farms: the reason might be that the comparison area lie farther away from the wind farm sites, therefore leading the respondents to believe that they will be less influenced from possible economic impacts.

Further on this topic, Ellis et al. (2007) found that anti wind rhetoric tied to economic motives was displayed by respondents by surveying local acceptability of the proposed off-shore wind farm of Tunes Plateau, due to be constructed within a 5-10 km distance off the North Antrim and Donegal coasts. The authors used q-methodology, which employs statistical analysis to analyse qualitative data and therefore establish patterns between different discourses (Barry and Proops, 1999). They generated four factors which jointly explained 62% of the total variance within the data generated by the interviews with the self-declared opponents. Of these four factors, one of them was named 'anti wind power local resister': this is a cluster of opinions accounting for 17% of the total variance dominated by a distrust towards wind energy as a viable and effective means of electricity production and by the perception that it will bear a negative economic impact for the local community. Two other factors, the 'anti-developer –pragmatic localist' and the 'economic sceptic -siting compromiser', respectively accounting for 14% and 10% of the total variance, share one core belief, which is that 'the scheme will result in a negative local economic impact' (Ellis et al., 2007, p.527).

Also Toke (2005b) attributes a great importance to the economic impacts of a wind farm siting. He carried out a regression analysis of the planning data regarding 51 wind farm cases in England and Wales and found that there was a statistically significant relationship between the independent variables 'opinion of the parish council', 'planning officer's recommendation', 'opinion of the countryside protection group' and the dependent variable of 'decision of the local planning authority'; he discusses these results in the context of further research data gathered through interviews and written material gathered

from the local authorities, DTI[4], ODPM[5] and BWEA[6]. Toke (2005b, p.1539) concludes that: "The dominant local perception of the economic impact of the scheme on the locality is also an especially crucial variable." In discussing the specific economic impacts he mentions the impact on the tourism industry, weather negative or positive, the perception of the wind farm being an element able to restore the positive economic image of an otherwise failing local economy, and the presumed capacity of wind energy to create local jobs. Toke (2005b) also states that different subjects belonging to different social classes might come to perceive the economic opportunity of wind farms in a different ways, with farmers on one side who see in wind farms as an opportunity and affluent middle class residents who instead might want to protect the landscape views and ultimately the economic value of their properties.

In the following paragraphs the specific economic factors, which are more likely to play a role in influencing the opinions of local residents, are detailed.

Local property values

The fear of diminished local property values as a consequence of siting of a wind farm has been discussed by Toke (2005b). This fear is demonstrated also by the attention given to the subject by a number of studies looking at the effect of wind farm siting on property values (Sterzinger et al., 2003, Sims and Dent, 2007, Sims et al., 2008), which found either no evidence, in the case of the American study of Sterzinger et al., or a tenuous and non-conclusive support for the case of decreased properties prices in the UK studies conducted by Sims et al.. The details of these studies on the real effect of wind farms on local property prices will not be discussed here because the main interest is in the locally perceived risk of devaluation of properties, which is an obviously different, (even though related), phenomena from the actual depreciation of properties once the wind farm has been built.

On the perceived risk of devaluation of property instead, it is possible to refer to the study of Jones and Eiser (2009), earlier introduced. They carried out a hierarchical regression analysis of the variables which can be perceived as local disadvantages related with a wind farm siting, at the same time controlling for a variable called 'general attitude to wind'. The results show that for the target areas residents, (residents adjacent to the

[4] Department of Trade and Industry
[5] Office of the Deputy Prime Minister
[6] British Wind Energy Association

proposed wind sites), the statistically significant factors which are found to influence support or opposition are: 'general attitude to wind' (0.28), 'spoil the landscape' (-0.23), 'lower house prices' (-0.14) and 'general unwanted change' (-0.33), while other variables including 'noise' and 'hazardous to health' are not found to be statistically significant. It is not clear how the data of the 'general unwanted change' variable was collected or what it represents exactly: the authors limit themselves to define it only as "A concern that wind development would introduce general unwanted change to the community..." (Jones and Eiser, 2009, p.4611). Nevertheless it seems that the most feared specific negative outcomes are the 'landscape negative impact' and immediately after 'lower house prices'.

In another study (Firestone and Kempton, 2007) regarding the proposed offshore wind farm of Cape Cod (Massachusetts, USA), 504 local residents were surveyed and it was found that the odds of supporting the proposed wind farm decreased of 88% if 'property values' were identified by the respondents as one of the three main issues related with the proposal. In this case, only 14% of opponents identified this issue as one of the three most important in affecting their decision to oppose. Nevertheless 48% of all respondents believed that the development would have had a negative impact on 'property values'.

The evidence reviewed amounts to only two studies, which appear to suggest that the perception of a negative impact on property prices might influence negatively the acceptability of the proposed wind farm. Nevertheless these do not appear as widespread concerns.

Effect on tourism

Another negative economic effect feared by the presence of wind farms is the one on local tourism. Toke (2005b) found that in a quarter of the 51 wind farm planning cases studied in his research the fears of negative repercussions on local tourism were a "significant issue" (Toke, 2005b, p.1538) and all these cases included areas with a significant number of tourism related economic activities.

Instead, Frantál and Kunc (In press) in a comparative study of two Czech touristic areas, one with a proposed wind farm and another with a built wind farm, found that local residents employed in the local tourism industry didn't have strong negative views towards the wind farm's influence on tourism, in both areas surveyed: 12% of respondents believed that the wind farm would have had a negative impact in the 'already built' case while only 5% believed the same in the 'proposed wind farm case'.

Contrasting evidence was found by Dimitropoulos and Kontoleon (2009). They, in a choice model study of acceptability of wind energy on two Greek islands of comparable size, Skyros and Naxos, found a "considerable divergence" (Dimitropoulos and Kontoleon, 2009 p.1848) in the perception of the threat to tourism between the residents of each island, with those on Naxos denying the risk while those of Skyros considering it as likely. This difference can perhaps be explained with the difference of developments being proposed on the islands: Skyros was facing the prospects of receiving ten large wind farms for a total capacity of more than 300 MW on a mountainous area, which has some degree of natural protection, and its residents were mostly aware of these plans. This difference would possibly suggest that the size of the proposed development and the natural value of the area would possibly play a role in influencing the concerns of residents with regards to the effects on tourism of proposed wind farms.

Firestone and Kempton (2007) asked about tourism impact too, when they surveyed the Cape Cod population regarding the wind farm offshore proposed development called Cape Wind, which would have been placed about five miles away from the coast. The Cape Cod area has a local economy based on tourism and fishing, (Firestone and Kempton, 2007), therefore the local population would have been arguably sensitive to a threat to tourism. The survey found that equal proportions (42%) of respondents considered tourism affected negatively, or not affected, while 8% held the opinion that the project would have improved local tourism. When asked about the three main factors leading to oppose the development, 15% of opposers included tourism in the top three, while the most chosen were marine life/environmental impacts 65%, aesthetics 51% and fishing impacts/boating safety 50% (Firestone and Kempton, 2007).

However strange it might appear to some, wind farms have also been documented to support the local tourism: Toke (2005b) presented the case of Swaffham in eastern England where a first tall wind turbine which comprised a viewing platform was installed and this, together with the local ecology centre constituted a tourism attraction which prompted the local parish council to ask the developer for more turbines. Even if this might appear an unlikely case, it is in some extent supported by the survey of Lothian (2008) who surveyed in Southern Australia 311 participants, presenting them with 160 pictures of landscapes comprising wind farms: he found that for the landscapes of low scenic value, wind turbines were actually increasing the perceived value of the landscape.

Further evidence implying a positive effect was gathered by Dalton et al. (2008), who surveyed 280 guests of four Australian hotels. Respondents were asked to express a

positive or a negative opinion, (acceptance or rejection), regarding a set of pictures including one presenting onshore wind farms on the coast, in proximity of "high density tourist accommodation" (Dalton et al., 2008, p.2182): about 68% of respondents expressed their positive opinion for this picture.

More research has focused on the real effect of wind farms on the local tourism industry, rather than on its anticipation in terms of perceived future impacts. Research conducted for the Scottish Government and led by Glasgow Caledonian University (2008) using a case study approach to assess the impact on tourism of future wind energy developments concluded that "...even using a worst case scenario the impact of current applications would be very small and for three of the four case study areas, would hardly be noticed." (2008, p.16). The Scottish case had been researched previously by MORI (2002) with a study which aimed at investigating the attitudes of tourists in Scotland towards landscapes comprising wind farms. MORI interviewed 307 tourists, face-to-face, in five locations Tarbet, Inverary, Oban, Campbeltown and Lochgilphead in September 2002. When tourists were asked whether the presence of wind farms had a positive or negative effect on the landscape, two in five (43%) maintained that it had a positive effect, while a similar proportion felt it was equally positive and negative. Less than one in ten (8%) felt that it had a negative effect (MORI, 2002, p.3). About 80% maintained that if a wind farm in the area of Argyll was open to the public, and it had a visitor centre, they would be interested in visiting the wind farm in another trip.

In conclusion, the evidence reviewed appears to be mixed, anticipating neither a clearly negative nor a positive effect. Nevertheless, there is the suggestion from a specific case surveyed, (Dimitropoulos and Kontoleon, 2009), that the size of the development might play a role in influencing the perception of the anticipated impact.

Local jobs

Local jobs are mentioned by advocates of wind farms and developers as a benefit deriving from wind farm developments.

Toke (2005b) refers about the case of Lowestoft, where an engineering firm required planning permission to put up a large wind turbine, which would have served as a prototype for future manufacturing: this move attracted a strong consensus in the local community that saw it as a chance of improving the prospects of the local job market.

Clearly this could be considered as an extreme case of a likely gain in numbers of jobs available in a local community.

Firestone and Kempton (2007) in the afore referenced study of a proposed off-shore wind farm in the area of Cape Cod, found that 37% of local residents believed that the wind farm would have impacted positively on job creation, 28% that would have had no impact and 27% were not sure, while only 8% believed that would have had a negative impact. Despite this only 18% of the supporters of the wind farm included 'job creation' within the main three reasons for their support. Firestone et al. (2009) repeated the same study in Delaware with both a 'state-wide' sample and a 'ocean area' sample and they found in these cases higher proportions of respondents believing in a positive impact on job creation, respectively 48% for the 'ocean area' sample and 71% for the state-wide sample; nevertheless, again just a minority of respondents of respectively 25% and 28% indicated job creation within the three major reasons for their support to the project. Firestone and Kempton (2007) asked the respondents of Cape Cod who expressed opposition if they would have been more supporting knowing that the project would create new jobs: for 44% of opposers it did not make any difference, 22% said that they would support it 'somewhat more', 17% responded 'just a little more' and another 17% 'much more'. If compared with other benefits, that if known would switch opposers to support 'much more' the development, 'create new jobs' is just in seventh place, the first three being :'Cape would receive the generated electricity' 33%, 'help the local fishing industry' 32%, 'improve air quality on the Cape' 27%.

In the survey of Jones and Eiser (2009) earlier introduced, (in this section), the hierarchical regression analysis, performed shows that 'employment opportunity' did not appear as a statistically significant economic benefit capable of influencing support, for the residents leaving in the areas adjacent to the proposed wind farms, but it was instead significant for the residents in the comparison areas which lie farther away from the sites. Nevertheless in the context of the regression analysis performed it showed to have a limited effect on support and opposition, with a standardised beta coefficient of 0.09, which compared with 0.15 of 'general economic benefit' and 0.50 of 'general attitude to wind', the other two variables included in the regression analysis which were found to be statistically significant.

On the real effect of wind farms on local employment Munday et al. (In press) researched the economic rural development opportunities generated by wind farm developments in rural Wales. The authors made the point that job gains for the whole Wales would have

been quite modest following the significant expected investments in large wind farms in the Strategic Search Areas, to the point of being "...perhaps less than 150 direct jobs across Wales as a whole." (Munday et al., In press, p.6), motivating this estimate with the nature of wind turbines business, which relies on the manufacturer for maintenance and with the nature of the technology involved which requires little onsite maintenance.

The conservative estimate of Munday et al. is confirmed by an earlier report of the Centre for Sustainable Energy (In press, p. 12-13), where the authors write: "Historic levels of development have been too low and too unpredictable to secure the wider available economic benefits of wind power development in terms of manufacturing and servicing jobs - so there isn't the 'it's good for Britain/the region' economic argument". This situation has partially changed in the last few years which have seen the UK wind power installed capacity increase substantially on a year to year basis, albeit still at a slower pace than other countries leading the European expansion, notably Germany and Spain (EWEA, 2009). Despite the manufacturing of wind turbines in the UK is a very small industry, recent articles in the press have announced investments by major firms (Reuters, 2011) therefore suggesting the possibility of a future gain in job numbers for the UK economy.

In conclusion it seems that there isn't a widespread perception that job creation could be a major benefit deriving from the development of a wind farm and even when this benefit is recognized by respondents, it doesn't appear to influence much the level of support.

Place attachment/identity

Bonaiuto et al. (2002, p.636) affirm that "Place Attachment was defined as the affective relation or the emotional bonds that people have with places where they live". In reality, as Hidalgo and Hernández (2001) point out, there is little agreement within the social sciences about an exact definition of place attachment. Hidalgo and Hernández build on a strand of research which points to a both a physical and a social attachment which would be subsumed by the concept of place attachment. This position appears to be accepted by more recent research (Devine-Wright, 2009) on the concept and its implications for research on social acceptability of wind farms.

Devine-Wright (2009) particularly proposes a framework to understand the role of place attachment in wind farm opposition. He argues that residents would likely go through a psychological process which can be synthesised in the following phases: 1. becoming

aware, 2. interpreting, 3. evaluating, 4. coping, and 5. acting. The residents would know through media and trusted others about the proposal and would gather information by the available sources thereby making sense of such information subjectively. The valuation phase could lead to alternative subjective stances related with the belief that the proposed project was alternatively place enhancing or disruptive. If the project was considered as disruptive coping strategies could be enacted including active forms of resistance such as joining opposition groups and campaigning. This outcome though is considered by Devine-Wright as dependent upon other variables which research on social acceptability has indicated to explain resistance: particularly political efficacy (Wolsink, 2000) and the presence of cohesive social networks (McLaren Loring, 2007).

Place attachment has been already researched empirically in relation with facility siting; Vorkinn and Riese (2001) investigated the role of place attachment in explaining the opposition to a large hydro-power station in Norway. A total of 305 questionnaires were collected through postal survey which had a response rate of 44%. Vorkinn and Riese carried out a regression analysis which comprised the demographic variables of gender, age, household income and place attachment, which resulted to be the single variable with the highest standardized coefficient (-0.185, $p<.005$) and the variable which explained the highest proportion of the variance, about 17%, of the attitudes

Devine-Wright and Howes (2010) tested empirically the theoretical framework of Devine-Wright (2009) earlier presented. They carried out a multi-method study using in depth interviews, focus groups and a questionnaire survey to investigate the role of place attachment and trust in shaping social acceptance of the proposed offshore wind farm of Gwynt y Morin, North Wales. The wind farm proposed (and now granted planning permission) consisted of 200 wind turbines for a total installed capacity of 750MW. The residents of Llandudno and Colwyn Bay were surveyed; Llandudno is a sea resort appreciated for the scenic beauty of the coast and reliant on its local tourism industry and with a large part (26%) of the resident population which is over 65 indicating its attractiveness to retired residents. Colwyn Bay is a former seaside resort with a declining economy which elicited, in the questionnaires' responses, negative words or phrases by its residents: the most frequently mentioned thematic category associated with the town was 'being run down'. A modest significant correlation (0.22, $p<.01$) between place attachment and opposition behaviour was found for the residents in Llandudno but no correlation was found for the residents in Colwin Bay. Bivariate correlations with place attachment were also tested with regards to several other variables. In the case of

Llandudno place attachment was significantly correlated with the statements 'create an eye sore', 'fence in the bay' and 'industrialise the area' while for Colwyn Bay the only significant correlation was with the statement 'help meet national policy targets'. Not surprisingly individuals that reported a high level of trust in the opposition group showed in the data a negative correlation between place attachment and project acceptance. Consistently, individuals that expressed low trust in the developer showed in the data a negative correlation between place attachment and project acceptance. Devine-Wright and Howes (2010) conclude that place attachment *per se* does not lead inevitably to opposition but it depends on how people interpret change and such interpretation can be influenced by the social context and moderated by the trust of people towards key organizations. Unfortunately the authors do not carry out a regression analysis between the surveyed beliefs that the development might affect negatively the local area economically and in its amenity including also place attachment and trust towards the developer and the opposition group. As a very high proportion of the survey respondents were elderly (the average age of respondents was 61) and particularly Llandudno respondents were slightly older and had spent less time living in the area, we might hypothesize that many respondents appreciated the amenity of the place which they might have chosen for their retirement, and therefore they were averse to the development. Further, they might have wanted to protect the value of their investment if they bought a property in the area. Conversely the residents of Colwyn Bay might have considered the wind farm an opportunity to get some funding for local regeneration projects, like an interviewee cited by Devine-Wright and Howes (2010, p.276) suggests. There might be also an issue of social affluence versus deprivation which would distinguish the two towns and which can influence levels of opposition as we will detail later in this chapter.

Hence, place attachment seems to have a role in influencing support or rather opposition, but to what extent and for which type of respondents isn't fully clear.

Environmental attitudes

Environmental attitudes are clearly significant in determining support for renewable energy, as these would make individuals more sensitive to climate change and other pollution effects of fossil fuels. Despite this, it has been pointed out (Warren et al., 2005) that some subjects might be sensitive to the protection of the local environment more than the global environment, in so expressing underlying pro-environmental attitudes which would in this case lead to oppositional behaviours to wind developments.

Swofford and Slattery (2010) in the study earlier introduced, (see paragraph '**Error! Reference source not found.**'), of residents' attitudes living close to the Wolf Ridge wind farm in Texas, found that respondents displayed high general environmental concern: 'protecting the environment is important to me' obtained about 93% of agreement, while the specific concern regarding climate change dropped to about 58% of agreement with the statement 'I am concerned about global climate change'. In this study about 60% of respondents showed a positive attitude towards wind energy. Of those respondents concerned with climate change about 63% showed support for wind while about 17% were against wind power. Of those respondents not concerned with climate change about 46% expressed support for wind and 27% were against. In this study therefore it is possible there is an influence of climate change concern on support for wind, although this does not seem to be great.

Dudleston (2000) in her study of residents living close to four constructed Scottish wind farms, (the study was earlier introduced in this chapter), constructed a scale of environmental concern based on 6 items which were asking respondents questions regarding: use of recycling facilities, membership of organizations committed with environmental protection, concern with damage to the countryside, concern about the loss of wildlife, concern about global warming, concern about depletion of natural resources such oil, gas and coal. Any positive answer would have got 1 point therefore placing each respondent on a scale from 6, high environmental concern to 0 low environmental concern. Dudleston (2000) found that respondents who displayed low environmental concern were often showing indifference to wind power, while respondents with an high environmental concern would have showed opposition to wind farms. The example provided by the author (Dudleston, 2000, p.26) regards a specific question about the level of concern if another wind farm was proposed in the area, which shows that the relative majority of respondents who were not at all concerned scored low in the environmental concern scale, while the relative majority of very concerned and fairly concerned scored high on the environmental concern scale.

Pro-environmental attitudes in the specific case of wind farms siting don't appear to play necessarily in favour of support even if they can. There might be a clash between those residents who see favourably wind energy as a good example of clean energy that needs to be developed to tackle climate change, while on the opposite side, there might be residents who are very concerned about preserving the features of their local environment.

Perceived non-local costs and benefits

Factors of non-local relevance could be called those factors which relate with the collective benefits and costs of wind energy at a societal, non-local level, (therefore global or national). The most evident of these could be: the perception of the role of wind energy in reducing pollution, particularly CO_2 emissions, the perception of the impact of wind energy growth on national energy security, the perception of the economic cost of energy produced by wind power, the perception of reliability of wind power versus other energy sources.

Decarbonising the energy supply

CO_2 emissions reduction is the most celebrated positive impact of electricity generation from wind farms at a global level, although the production of electricity from non-fossil fuel sources can bring also other important positive environmental impacts if we consider that electricity through fossil fuel production inevitably releases several pollutants which have a significant environmental impact (Williams, 1993) and consequently an impact on human health.

The relative importance of wind energy being perceived as a clean energy source in determining acceptability of proposed wind farms has been investigated in the study earlier referenced of Wolsink (2007b). Wolsink in his LISREL analysis of 725 responses of a survey investigating the motives for local wind farm acceptability found that the variable ‘wind as clean energy source’ was not correlated directly to the variable ‘resistance to local wind developments’ but only through the variable ‘wind power attitude’, nevertheless the variable ‘landscape/visual’ was correlated with ‘wind power attitude’ with a stronger correlation index of opposite sign, hence implying a larger significance on determining ‘wind power attitude’ and ultimately the will to resist a local development.

Offshore wind farms can still receive considerable opposition and some of the issues at stake might be the same, particularly the positive contribution of the wind farm in decarbonising energy supply: Firestone and Kempton (2007) surprisingly found that ‘global warming/climate change stability’ were a factor scarcely mentioned within the top three motives to oppose or support the Cape Cod proposed wind farm by the Cape Cod residents. Just 4% of supporters and equally 4% of opposers had considered this issue as one of the top three to form their judgement. Things changed when the survey was

extended to Delaware residents (Firestone et al., 2009) with 21% of the supporters living in the ocean area who indicated 'global warming/climate change stability' within the top three factors and 12% of supporters of the state-wide sample; in both cases of ocean area and state-wide residents, 0% of opponents indicated the climate change impact within the three top factors for their opposition. Even with an extended sample, the Firestone et al.' study (2009) shows that, at least for the specific case of Cape Cod, climate change mitigation was not within the most reported three reasons for support in any of the three whole samples, with other factors being more widely reported: in the case of Cape Cod residents, 'marine life/environmental impacts' was mentioned by 48% of the sample, 'electricity rates' 47%, 'foreign oil dependence' 37%; for the Delaware ocean area sample, 'electricity rates' was indicated by 56% of respondents, 'air quality' 46%, 'marine life/environmental impacts' 29%; for the Delaware state-wide sample, 'electricity rates' was chosen by 62% of the individuals surveyed, 'marine life/environmental impacts' 57%, 'air quality' 39%. As we can see from these results concerns which seem to affect more closely the respondents, in terms of geographical context, appear as more important for supporters than climate change mitigation. Nevertheless it is also the case that other environmental issues are in this case appearing within the first three motives for support particularly 'marine life/environmental impacts' mentioned in all three samples and 'air quality' for both the Delaware ocean area and the state wide samples. Interestingly 'electricity rates' are very highly rated within the three samples and they are actually the most reported motive for support for the two non-local samples (Delaware ocean area and sate wide). This misconception of wind energy delivering cheaper electricity has been suggested as a reason for the popularity of wind power in the US (Klick and Smith, 2010).

Klick and Smith (2010) in their study of a national sample of 610 adult US citizens asked respondents several questions regarding their knowledge of wind energy and about their agreement with positive or negative impacts of wind farms. They found that the positive aspects of wind energy were attracting more agreement than the negative with about 81% rating as 'very important' both the statements 'emit no pollution' and 'emit no greenhouse gases' while the highest percentage of respondents for the negative statements was obtained by the statement 'more expensive' rated as 'very important' by 31% of the respondents (and as 'somewhat important' by 46%). In one of the two regression analyses that the authors carried out the two leading factors which led to support were 'reduce imported energy' (0.26, $p<.01$) and 'emit no pollution' (0.20, $p<.05$) while the two factors

having the strongest negative impact on support were ‘lower property values’ (-0.16, p<.01) and ‘more expensive’ (-0.16, p<.01). In this case the visual impact seemed to have a non-statistically significant impact of modest magnitude. We have to bear in mind though that this was a national sample which was asked in general about wind energy and research has shown that resistance towards wind energy is stronger when residents are surveyed about specific locally proposed projects (Wolsink, 2007b, Haggett, 2004).

Swofford and Slattery (2010) investigated the public attitudes of residents within 20 km radius from Wolf Ridge wind farm in Cooke County, Texas, a wind farm commissioned in 2008 and comprising 75 wind turbines. Respondents were surveyed through a postal survey which had 200 surveys returned and a response rate of 13.3%. They found that about 60% expressed support towards wind while about 18% had a negative attitude towards wind energy. 58.4% of respondents agreed with the statement ‘I am concerned about global climate change’: specifically 63.3% of respondents who supported wind agreed while only 17.4% of those that expressed a negative attitude towards wind agreed with the statement. In those respondents not concerned with climate change about 46% still supported wind energy while 27% had a negative attitude towards wind. Only 34.5% agreed to support renewable energy even if costs more than energy from fossil fuels. About 47% considered wind farms ‘an unattractive feature of the landscape’ while 20.5% disagreed and 22.3% were neutral. Therefore it seems that the Texan residents were motivated in their support and opposition by the contribution against climate change of wind energy but nevertheless their support fell if it was said that wind along other renewable sources was an increasing the price of energy in comparison with fossil fuels. Further wind visual impact was polarizing respondents with a large number saying that it was an unattractive feature of the landscape.

Concluding, it could be said that decarbonising energy supply is one of the factors that studies have indicated as influencing support towards wind farms, nevertheless it appears that other concerns related with the local environmental impact of the wind farms or economic considerations about their development might be perceived as more important in shaping support and opposition.

Improving air quality

Wind farms deliver also the benefits of a general improvement in air quality with no emission of particulate matter and other pollutants originating from the combustion of

fossil fuel power plants. In the future a large deployment of renewables combined with a mass scale development and commercialisation of electric cars could lead to the demission of combustion engines in transport, with further vast gains in terms of air quality and related public health improvement. At the moment though this possibility is far from being achieved and the resulting marginal improvement in air quality from the construction of a single wind farm is unlikely to be perceived by anybody living close to the wind farm, unless for example the wind farm would possibly be developed on the land earlier occupied by a combustion power plant.

This advantage of wind power is mentioned along with the other societal advantages of wind energy (Toke, 2002, Sustainable Development Commission, 2005) but not much specifically investigated.

Firestone et al. (2009), in their survey earlier introduced regarding the Cape Cod offshore wind farm proposal and a similar hypothetical development in Delaware, found that 23% of the residents of the Cape Cod area, 46% of the residents of the Delaware ocean area and 39% of the Delaware state-wide area considered 'air quality' within the three most important factors to influence their decision to support the wind farm. Within the group of the most important three factors in shaping the personal decision to support, 'air quality' for wind supporters of the Cape Cod area was the 5th most nominated factor while it was the 2nd most nominated factor for the Delaware ocean area respondents and the 3rd for the Delaware state-wide respondents. Consistently throughout the three samples of residents 'electricity rates' was nominated more than 'air quality' as one of the three most important factors. For the Cape Cod and the Delaware state-wide samples also 'marine life/environmental impacts' factor was nominated more than 'air quality'. In all the three cases 'global warming/climate stability' was nominated within the group of three most important factors considerably less than 'air quality' with the percentages of 4, Cape Cod, 21 Delaware Ocean Area and 12 Delaware state-wide.

Hence, it appears as air quality could possibly be a relevant factor influencing support for wind energy but again, like 'decarbonising energy supply', is likely to be perceived as less important than local or economic factors.

Cost of electricity production

The cost of electricity produced by wind energy has been considered in several studies which we have introduced in previous sections (Firestone and Kempton, 2007, Firestone et al., 2009, Jones and Eiser, 2009, Swofford and Slattery, 2010, Klick and Smith, 2010).

Cheaper electricity rates were found to motivate consistently support in the three samples (Cape Cod area, Delaware ocean area and Delaware state-wide) surveyed by Firestone et al. (2009): electricity rates appeared within the two most reported reasons for support, for all the samples, when respondents were asked which were the three most important reasons for their position regarding the wind farm.

Also Jones and Eiser (2009) found 'cheaper electricity' to be an influential factor. They run a hierarchical regression analysis of hypothetical benefits deriving from the proposed wind farm controlling for 'general attitude' towards wind. It was found that, for residents living in areas adjacent to the proposed sites, 'cheaper electricity' was a statistically significant factor leading to support (0.13, $p<0.010$) which nevertheless presented a lower standardized coefficient than 'general attitude' towards wind (0.32), 'general economic benefit' (0.30) and the same of 'opportunity to invest' (0.13).

On the same topic, Swofford and Slattery (2010), (introduced earlier, see paragraph '**Error! Reference source not found.**'), found in their sample of residents close to the Wolf Ridge wind farm in Texas that while about 60% of respondents held favourable views towards wind and about 84% agreed that 'we should use more renewable energy to fulfil US energy demands' only 34.5% agreed with the statement 'I am willing to support renewable energy even if it costs more than energy from fossil fuels', thereby suggesting that support is conditional to electricity cost for consumers.

Finally, Klick and Smith (2010) in their regression model explaining support for wind, found a negative significant correlation (-0.16, $p<.01$) between the belief of wind energy being 'more expensive' and support, although this was found only for the regression analysis of the support variable related to the question of support/opposition presented at the end of the questionnaire, while data collected through the same question at the beginning of the questionnaire does not present a significant correlation with the 'more expensive' variable. Likely the questionnaire therefore induced a process of reflection on the pros and cons of wind energy.

Thus the cost of electricity produced by wind energy appears to be an issue considered by respondents which emerged in various surveys even though it is not clear how much can motivate either ways respondents.

Reliability of wind energy supply

Reliability of wind energy supply is considered an issue which opposers to wind energy point to, in order to motivate their opposition (Country Guardian, 2000). The Sustainable Development Commission (2005) plays down the significance of the issue highlighting the technical feasibility of including in the power supply increasing shares of wind energy generation and explaining that the increased cost due to wind generation output variability would be limited, unless the share of wind energy supply becomes very large.

Devine-Wright and Devine-Wright (2006) investigated how organizations and campaign groups communicated the issue of intermittency to the public and they found that intermittency was communicated differently whether the communicators were in opposition or support of wind energy: opposers were usually highlighting 'unpredictability' and 'uncontrollability' while supporters were talking instead of 'variability' and 'fluctuation'.

Warren and McFadyen (2010) in their comparative study about community wind farms introduced earlier in this chapter (see paragraph '**Error! Reference source not found.**') asked both their samples in Kintyre and Gigha to identify their two greatest concerns about wind power, the category which received the largest response was no concern (48% Kintyre, 32%Gigha) followed by, in order of decreasing importance, intermittency of production, visual impact, bird strikes on turbines and habitat disruption (the authors don't provide percentages with regards to these variables).

The evidence regarding how this argument might influence support is very limited, nevertheless it has to be borne in mind that it is one of the most used by opposers, therefore it is reasonable to think that many people might be familiar with it.

Energy independence and security

Energy security is mainly intended as the "threat of abrupt supply disruptions" (Awerbuch, 2006, p.693) even though Awerbuch (2006) proposes to extend the meaning to the risk created by fossil fuels price volatility. He argues that adding increasing shares of wind, geothermal energy and other renewables to the energy generation portfolios of EU and American economies would increase their energy security in terms of both energy supply and generating cost.

Eltham et al. (2008) whose study was introduced earlier in this chapter, (see paragraph 'Noise'), found that residents living in St Newlyn East (Wales) about 2,250 m from the Carland Cross wind farm, (a cluster with 6MW of total capacity, 15 turbines and built in 1992), in 2006 considered 'energy security' as the most positive of the set of self-identified positive impacts that they reported. Energy security was reported as a positive impact by 41% of residents ahead of 'visual attraction' 40% and 'green power' 22%. Just 6% of respondents reported of considering energy security as a positive impact during the planning phase in 1991 thereby showing a vastly change of perception of the importance of this issue along the years.

Again like others, this issue might play a secondary impact in local opposition or support, mainly because a single wind farm wouldn't contribute in a large way to this problem, nevertheless, it can be still perceived as a relevant argument influencing the debate.

Environmental factors of local relevance

Environmental factors of local relevance are well known and often mentioned in academic and non-academic publications as a source of local opposition. The most evident and discussed are here presented: the local landscape visual impact, the audible noise and the non-audible low-frequency noise.

Ultimately these factors are considered attitudinal because they are anticipated effects of the future wind farm, i.e. they are not actual physical phenomena that impact on residents' lives.

Visual impact

Local visual impact is regarded as a very important factor in determining local opposition to a proposed wind farm (Warren et al., 2005, Wolsink, 2007a); Devine-Wright writes (2005a, p.127): "Research attempting to identify possible reasons for public opposition to wind farms has noted visual impacts and noise as the most frequently reported problems."

Warren et al. (2005) in a survey of residents close to the Dun Law wind farm, (which was being built at the time of the survey and consists in 26 turbines for a total of 17.2 MW of installed capacity), in the Scottish Borders, found that the residents surveyed considered the visual impact as both the most important positive impact, (34% indicated that turbines

were ‘attractive feature in the landscape’), and the most important negative impact, (‘unattractive feature in the landscape’ for 44% of respondents), of the wind farm. Unfortunately the lack of further statistical analysis does not offer any indication of the strength of the relation between visual impact and support/opposition nor about the relative influence of the visual impact in determining support/opposition when compared with other variables.

Wolsink (2007b) instead reports the finding of a study in which 725 Dutch respondents were asked to rank the significance of several issues with regards to wind power, and to assess the importance of each issue on a 7 point Likert scale. The author draws the attention of the readers to the regression analysis of this set of data, which shows that the visual impact has a far larger impact (0.48 $p<.001$) on ‘wind power attitude’ than the other variables included (‘decrease environmental issues’ 0.19 $p<.001$, ‘annoyance’ 0.17 $p<.01$, ‘electricity sector’ 0.07 $p<.05$). The same respondents (Wolsink, 2007b) were asked about the intention to oppose a proposed local wind farm: the analysis conducted showed how ‘landscape visual impact’ had the largest impact on both the variables ‘wind power attitude’ (.74) and ‘resistance to local wind developments’ (-.20), within a group of variables comprising: ‘wind as clean energy source’, ‘fairness/equity/nimby’, ‘personal political efficacy’, ‘annoyance’.

In a more recent study, Meyerhoff et al. (2010) investigated the perceptions of the public for different options, in size and distance from residential areas, for developing onshore wind farms, which would contribute to the 2020 German target of 30% of electricity produced by renewable energy sources. The authors carried out 708 phone interviews, roughly equally divided between the regions of Westsachsen and Nordhessen, using a choice model method. They found that the perceived environmental quality in the regions was not influenced, nor by the vicinity of respondents to the wind farms, neither by the frequency of encountering turbines in the landscape. Nevertheless the authors also found that respondents on average prefer moving turbines further away from residential areas and value negatively the impact on biodiversity (Meyerhoff et al., 2010, p.91). Unexpectedly the height of the turbines does not influence respondents’ choices: such finding contrasts with the expectation that respondents would have preferred smaller turbines for the reduced impact on the landscape.

With regards to the number of wind turbines and its effect on support of wind farms, Devine-Wright (2005a, p.127) reports on a number of studies which have highlighted the

relationship between the size, i.e. the number of turbines, and support, referring to this as a negative linear relationship between the size of the wind farm and support.

In fact, a study conducted in Ireland by Sustainable Energy Ireland (SEI) (2003) showed that there was a preference for smaller clusters of turbines, rather than large ones: interestingly smaller clusters of taller turbines were preferred over larger clusters of smaller turbines.

As already shown earlier, citing Warren et al. (2005), there might be the case of non-marginal positive appraisals of wind farm's impact on the landscape. This seems to be possibly related with the different perception that subjects have about the landscape in which the wind farms are placed. Research conducted by Lothian (2008) (cited earlier in this chapter) showed a possible difference in the appraisal of wind farms shown in different types of landscapes with wind farms being perceived as enhancing the landscapes of perceived low scenic quality and detracting from the landscapes of perceived high scenic quality. Nevertheless this finding is not shared by the study of SEI (2003) which using the same procedure of the study of Lothian, showed to Irish respondents pictures of different types of landscape which were first shown without turbines and which were rated in terms of amenity. The landscapes which were considered most beautiful 'costal area', 'mountain moorland' and 'fertile farmland' did not seem to be considered affected negatively by the presence of wind farms, e.g. for the 'costal area' respondents rated the scenic impact of a wind farm as 'very positive' 15%, 'fairly positive' 29%, 'neutral' 29%, 'fairly negative' 19% and 'very negative' 7%. In comparison, the same question regarding the 'urban/industrial area', considered the least beautiful of the areas pictured, shows little difference: very positive' 13%, 'fairly positive' 32%, 'neutral' 33%, 'fairly negative' 15% and 'very negative' 7%.

In conclusion, it appears as the visual impact is considered by scholars a significant element in influencing respondents' views about wind farms, nevertheless the opinions of respondents are not unanimous, some subjects might consider the wind farms as enhancing the value of the landscape while others as detracting. There is some evidence pointing to a preference of the public for smaller clusters, rather than large ones.

Noise

Noise is considered one of the most frequently reported problems by research explaining opposition (Devine-Wright, 2005a). Nevertheless, not many studies investigate the

significance of noise in determining opposition before construction. One of these was reported by Wolsink (2007b): in this study 725 Dutch respondents were asked about the intentions to oppose a local wind farm and their motives and a LISREL analysis was carried out which included the following factors 'landscape/ visual', 'wind power attitude', 'wind as clean energy source', 'fairness/equity/nimby', 'personal political efficacy' and 'annoyance' which comprises in itself noise, light and flicker. 'Annoyance' was found to be the third most important factor influencing 'resistance to local wind developments' after the variables 'landscape/ visual' and 'wind power attitude', which was itself substantially determined by 'landscape/ visual'.

In another study, Eltham et al. (2008) investigated the change of attitudes towards a wind farm development from the pre-construction to the post-construction phase; the case studied was the wind farm of Carland Cross in Cornwall, a wind farm of 15 turbines for an overall installed capacity of 6MW, which is laid just over km 2.25 from St Newlyn East, a village with a population of 1230 inhabitants who were surveyed in the number of 100 through face to face interviews, which were conducted door to door and which employed a questionnaire including closed and open ended questions. The respondents were asked to remember their attitudes towards the development pre-construction and post-construction: they were initially asked to mention the negative and positive impacts of the development and once these were listed each element was rated on a five point Likert scale. The results show that the most feared negative impact before construction was noise, which was perceived as a negative impact by 23% of respondents that decreased to 15% when respondents were asked about their post-construction perception, (a statistically reliable change). The second most feared negative impact is visual intrusion at a level of 19% pre-construction and 15% post-construction. In this respect the research of Eltham et al. seems to change the ranking of importance of perceived expected negative impacts which indicated the visual as the most important in the studies earlier cited (Warren et al., 2005, Wolsink, 2007b).

Warren et al. (2005) found in a sample of residents living around two built wind farms, in south-west Ireland, that the most feared expected negative impact was the visual (89%) followed by noise (59%), Eltham et al. (2008) explain the difference with their study indicating as possible explanations the fact that the wind farms researched by Warren et al. were built later, with the use of larger turbines and further they indicated as another reason the fact that respondents in Warren an colleagues' study would have had the chance to experience first-hand, or through the media, the visual impact of wind farms,

while the villagers of St Newlyn East would have not, being their wind farm built in 1992, therefore at a time when wind power in the UK was still little known by the public.

The finding of Eltham et al. is not isolated, Exeter Enterprises (1994) which surveyed before (1990) and after (1992) construction 435 residents within 2 km radius from the wind farm site of Delabole, (a cluster of ten turbines), in Cornwall found that noise was the most important expected negative impact, (86%, down to 20% after construction) while the visual impact was less of a concern (about 50% pre-construction and still considered a problem by 25% after construction). Nevertheless the majority of the surveys reviewed show that noise was an anticipated negative outcome of lesser importance than the visual impact.

Beyond the earlier cited studies (Warren et al., 2005, Wolsink, 2007b), others report an higher concern with the expected visual impact over noise e.g. Dudleston (2000) surveyed 430 residents living within 20 km from four operational wind farms in Scotland, finding that noise before construction was recalled to be a concern by 12% of respondents, second in importance after the visual impact (27%), while the percentage of respondents who disliked the noise impact of the wind farm was only 2% post-construction. Equally, Braunholtz and McWhannel (2003) who surveyed 1810 residents living within 20 km from 10 large Scottish wind farms found that noise was anticipated as a problem by about 12% of respondents, but only about 2% of the respondents considered this a problem after construction.

Eltham et al. (2008, p.30) point out that in the proportion of the surveyed population which anticipates noise as a negative impact varies greatly from 12% (Dudleston, 2000), to 59% (Warren et al., 2005) and 86% (Exeter Enterprises, 1994). It is noticeable that the proportion of the studies of Warren et al. and Exeter Enterprises are far higher (respectively 59% and 86%) than those of the other studies referenced; perhaps the explanation is that in the cases of these two studies the respondents were surveyed before the construction of the wind farm, i.e. they were not interviewed post-construction and asked to recall their opinion at the time of when the wind farm was not in place: this might have generated answers which were not influenced by the process of recalling old memories, which, particularly if the attitude towards noise was changed, i.e. noise was not considered a problem after construction, might have generated in the respondents the wish of representing their old attitudes consistent with their new attitudes, hence reporting less the negative expectation about noise impact in the pre-construction phase.

The decreased perception of noise as a negative impact from a pre-construction to a post-construction phase is instead consistent in all the studies reviewed that compared the pre-construction to the post-construction attitudes (Exeter Enterprises, 1994, Dudleston, 2000, Braunholtz and McWhannel, 2003, Eltham et al., 2008), this being a change of attitudes that has been noticed and highlighted in literature (Warren et al., 2005).

A specific type of noise is low frequency noise which can be audible and not audible. It has received consideration in research as a type of environmental impact of wind farms. Low frequency noise emitted from wind farms could theoretically produce negative health consequences for exposed subjects. The concern of low frequency noise was registered in the words of two opposers interviewed in the first study conducted for this PhD research. The use of the low-frequency noise argument by anti-wind farms activists can be traced in the material that they have produced (e.g. see Country Guardian, 2000). We can't trace surveys studying specifically the influence of this expected negative impact on social acceptability of proposed wind farms.

Research about low frequency noise and wind turbine seems to exclude any risk for human health: "There is no evidence to indicate that low-frequency sound or infrasound from current models of wind turbine generators should cause concern to anyone living close to a wind turbine generator or a wind farm." (Bellhouse, 2004).

Nevertheless concerns regarding the possibility of low frequency noise, and other noise deriving from wind farms, affecting negatively the health of local residents through hindering their restoration have been expressed within the academic community (Pedersen and Persson-Wye, 2008) although based on non-conclusive research and dismissed by a literature review, (Roberts and Roberts, 2009) conducted recently for the Wisconsin Public Service Commission that found that low frequency noise is not proven to cause any disease or health condition. Rather, the authors talk of 'annoyance' which is considered a normal reaction to any type of noise: Pedersen et al. (Pedersen and Persson-Waye, 2004, Pedersen et al., 2007, Pedersen and Persson Waye, 2007, Pedersen and Persson-Wye, 2008) and Janssen et al. (2009) found that annoyance caused by wind farm noise is related to sound pressure levels, the environmental features of the place and the attitudinal disposition towards the wind farm.

With regards to the relationship between negative perception of noise of wind farms and other variables, Pedersen and Persson-Waye (2004) conducted a study in Sweden in 2000 through a survey that obtained 351 responses; they found that a significant correlation

was present between the attitude towards the visual impact of the wind farm and 'noise annoyance'. The findings were confirmed by a later research of Pedersen and Larsman (2008) which analysed two cross-sectional studies through structural equation modelling: 1095 residents living in the vicinity of twelve wind farms in Sweden were surveyed, the results show that for both respondents living in a dwelling from which they can or cannot see the wind farm, the variable which has the highest positive correlation coefficient with 'noise annoyance' is 'visual attitude' while 'noise level' come second and 'general attitude' (towards the wind farm) is not correlated. The correlation values are stronger for both variables 'noise level' and 'visual attitude' in the case of residents who can see the wind farm from their dwelling.

Interestingly noise appears to be less perceived as an annoyance by subject who benefit economically from the presence of a wind farm: Janssen et al. (2009) analysed the data from three surveys (one in Holland and two in Sweden) and found that the respondents who answered yes to the question: 'do you partly own one or more wind turbines?' reported less annoyance caused by noise; conversely respondents who said that could see one or more wind turbines from their dwelling reported higher levels of annoyance.

The studies reviewed make clear that noise is considered, at a pre-construction phase, a common concern and one of the most related with acceptability of a locally proposed wind farm. Nevertheless, this concern comes usually second after the visual impact of the development and more importantly, it appears to diminish drastically at a post-construction phase, i.e. many respondents don't consider noise as a real issue after construction.

1.5.4 Personal resources

Personal factors might affect respondents; particularly, here were reviewed three of them that in literature have been found to influence support and opposition to wind farms: knowledge about wind energy, affluence and deprivation and proximity to the proposed wind farm site.

Knowledge about wind energy

Knowledge about energy, renewable energy and particularly wind energy, can influence the attitudes of the public in general and also of residents living close to wind farm developments. This might appear as an obvious statement, as we have already highlighted

in this chapter how beliefs about deriving from correct or incorrect information can influence acceptability, e.g. beliefs about the economic cost of electricity produced through wind power or the possible negative health effects of wind turbines on the local population surrounding the wind farm.

The larger the number of issues which are misrepresented to the public the grater is the risk that this might have a negative (or positive) impact on acceptability even at the local level. Klick and Smith (2010), whose study we introduced earlier in this chapter, asked four questions regarding knowledge of wind energy and two of these obtained answers which were largely correct: 'wind turbines pollute less', 87% correct, 'wind is alternative energy' 80% correct; instead two other questions obtained in one case a smaller majority of correct answers 59% for the item 'electricity flow is not stable' and in one case only 18% were correct 'wind electricity costs more'. In this case the authors found that there was a poor correlation between correct responses across the items, therefore indicating that subjects were answering correctly some questions and incorrectly others. Further, the authors found that the knowledge of the public of wind power was far from good and they suggested that a more accurate knowledge, particularly about the economic cost of wind power, might decrease the support of citizens. While it can be safely assumed that local impact comes into play when the public is surveyed regarding a local wind farm project it is nevertheless reasonable to believe that knowledge about wind energy will influence in some extent their attitude towards the development. In a meta-analysis of psycho-social determinants of pro-environmental behaviour, Bamberg and Möser (2007, p.22) found that knowledge and awareness are an "...important indirect determinant of pro-environmental behaviour."

Affluence/deprivation

We pointed earlier to Toke (2005b) who stated that different subjects, belonging to different social classes, might come to perceive wind farms in different ways, with farmers on one side, who see in wind farms an opportunity, and affluent middle class residents on the other, who might want to protect the landscape views and ultimately the economic value of their properties.

van der Horst (2007) in a literature review on the concept of nimbysm[7], focusing on location characteristics, highlights the differences between rural areas of higher landscape value, which are in a commuting distance from economically active areas, and rural areas that are more remote and/or have low landscape value, due to an industrial heritage. The high landscape value well connected areas are likely to attract affluent middle classes seeking for retreating in the countryside in pursue of the 'rural idyll', while low landscape rural areas with an industrial heritage are more likely to host less affluent or deprived residents who might be more used to industrial facilities and might therefore accept more easily the presence of wind farms. Conversely the wealthier residents in the high value landscape areas might fight against wind farms in their area to protect "their financial and emotional investment" (van der Horst, 2007, p.2709). van der Horst and Toke (2010) highlight also the different capacity to lobby against proposed wind farms that residents from an affluent and a deprived background have. The authors carried out a study which investigated how 117 variables regarding education, health, demography, employment and housing relate to areas of England and Wales in which the wind farm applications were rejected or accepted in the 1991-2006 period. van Der Horst and Toke found that the areas that that are more likely to refuse planning permission have a population with higher life expectancy, higher voting turnouts and lower crime privation indexes i.e. lower exposure to crime. If the analysis is extended to the appeal stage, other variables along with the ones mentioned come into play and namely lower health deprivation index, smaller percentage of people aged 16-24, higher proportion of self-employed, fewer students, more self-employed, lower proportion of people working in public administration, defence and social security, lower illness and disability, fewer road accidents and higher proportion of second homes and holiday homes. It seems therefore that the areas which are more affluent and less deprived resist more or more efficaciously to proposed wind farms in their areas. The finding is consistent with research on LULU (locally unwanted land use), which shows that deprived areas are more likely to host unwanted facilities (van der Horst and Toke, 2010). Whether these findings are due to a higher political efficacy of residents living in affluent areas or to higher levels of opposition is debatable.

Firestone and Kempton (2007) in their study of the Cape Cod offshore wind farm earlier introduced, found that opponents were more likely to earn more than $200000/year

[7] From the acronym NIMBY, i.e. 'not in my back yard', defined as "…a colloquialism signifying one's opposition to the locating of something considered undesirable in one's neighborhood." (Kinder, 2016)

(Firestone and Kempton, 2007, p.1596), while residents in the income bracket of $ 150000-199999, included in their logit regression analysis, were 20 times more likely to support the wind farm. Belonging to lower income brackets up to the lower threshold of $35000 per year, also were found to make residents more likely to support the wind farm, while belonging to the income level lower than $35000 was not significant at the 5% level.

Stern (2000) in his review of published research on environmentally significant behaviours states that socio-demographic variables such as age, educational attainment, race and income have a limited explanatory power for many environmentally significant behaviours but those that depend on particular capabilities; he provides the example of 'environmental citizenship' which in a study that he conducted (Stern et al., 1999) was used as a label to define a set of active pro-environmental behaviours which could be otherwise described as environmental activism (e.g. signing petitions, boycotting companies or products, donating to environmental groups etc.). These behaviours were found to be positively associated with income. As Warren et al. (2005) indicated, both support and opposition to wind farms can be considered two forms of environmentalism and with regards to opposition, van der Horst and Toke (2010) suggested that this can be stronger and more effective in affluent areas as earlier mentioned.

Affluence and deprivation therefore appear to have an impact on social acceptability, whether this is triggered by the will of defending a property investment or by a higher level of education, usually related with higher incomes, has to be established. It cannot be denied, as earlier mentioned, that less deprived areas are usually those presenting an unspoiled countryside environment that might trigger *per se* an opposition, based on pro-environmental values that become salient when the integrity of the local environment is perceived to be under threat.

Education

Given the nature of co-operative wind farms, also education could possibly play a role: the more educated subjects are, the more likely they would be to understand the co-operative scheme with its social and financial implications.

Research has showed that higher education correlates with more proenvironmental attitudes and behaviours. Barr et al. (2005) studying household pro-environmental behaviours found that the cluster of respondents defined as "committed

environmentalists" were middle income and had a higher number of degree holders. Shen and Saijo (2008) in a dedicated study on socio-demographic characteristics and environmental concern which surveyed 1200 respondents through face to face interviews in Shanghai (China) found that respondents with a college degree or above showed significantly more environmental concern than other respondents.

Proximity of residence and time of survey

Research on wind farms (Krohn and Damborg, 1999, Braunholtz and McWhannel, 2003, Warren et al., 2005, Bishop and Miller, 2007, van der Horst and Toke, 2010) shows that before construction, residents closer to development would be more concerned and negative about the project that residents living further away.

Proximity of residents to the wind farm site was pointed to as a factor influencing levels of opposition and support and was indicated to change over time in relation with the event of the construction of the wind farm, with local residents displaying greater support after construction while the opposite is true before construction (Warren et al., 2005, van der Horst, 2007). Devine-Wright (2005b) mentions contrasting studies about the influence of physical proximity on local residents' perception of wind farms, but his review seems to be limited to social research on residents' attitudes after that the turbines are in place.

Warren et al. (2005) propose what they call an 'inverse NIMBY' syndrome, which holds that after construction individuals living closer to the wind farm display more support for the wind farm than residents living farther away. They surveyed residents living close to four wind farm sites, three of these sites had a wind farm already constructed at the time of the survey, while one of them did not. The sites were two in south west Ireland and two in south east Scotland. The authors found that the residents, close to the Black Hill wind farm proposed site, displayed more opposition than the residents living close the constructed Dun Law wind farm. Further, in the case of Black Hill residents living closer to the site displayed higher opposition, 33%, than residents living farther away, 3%. In the case of Dun Law it was the reverse with residents within the 0-5 km from the wind farm area which displayed less opposition, 6%, than residents in the outer area of 5-10 km from the wind farm, which showed more opposition, 10%. An explanation of this difference is that residents living close to the wind farm, after construction, gain a direct experience of the wind farm and change their attitudes, while the same is not true for those who live farther away (van der Horst, 2007).

Dudleston's (2000) findings are coherent with Warren et al.' study. The author found that in the four operational Scottish wind farms surveyed, residents living in close proximity to the wind farm were more pleased with them: 67% overall said that there was something that they liked about their local wind farm, while the proportion rose to 73% in the high proximity zone of 0-5 km from the wind farm. Dudleston also found that the proportion of residents who anticipated problems with the wind farm was far higher, 40%, than the proportion of residents who actually reported problems once it was constructed, 9%. Nevertheless, we have to remind that Dudleston's study asked people to recall the concerns that they held before construction and asked them to report the current problems, therefore allowing for some inevitable misrepresentation of past concerns. Although it is supposable that residents might actually have reported less past concerns, in order to appear consistent with their current problems experienced, the fact that concerns preconstruction were much higher than current problems experienced might indicate a real decrease.

Braunholtz and McWhannel (2003) with their survey of residents living close to 10 large operational wind farms, (earlier introduced in this chapter), confirm that residents living closer to their local wind farm hold more positive views of it. When asked what effect the wind farm had in their local area, 45%, in the 0-5 km area from the wind farm site, said 'generally positive' or 'completely positive' while this percentage declined to 42% in the 5-10 km area and further declined to 17% in the 10-20 km area.

While Wolsink (2007b) denies this link between vicinity and different attitudes presenting two studies, but his arguments do not sound convincing, in fact in the first case the sample is composed by the members of a national organization having the aim of protecting a natural Dutch area ecologically important and therefore their attitude towards the presence of turbines in this same area is not influenced by their vicinity to the area but rather by their membership, which makes all the individuals holding similar attitudes towards the protection of such area. The second example cited by Wolsink (2005) regards a Swedish study (Ek 2005 in Wolsink, 2007b) where is surveyed a national sample, in this case despite statistically non-significant (0.17), as the author states, in reality a positive link is found between vicinity and positive attitudes towards wind farms that are in place, therefore suggesting a weak support to the 'inverse NIMBY syndrome'.

Finally, Eltham et al. (2008), (in the study earlier introduced of residents' opinions regarding Carland Cross wind farm), found that despite a non statistically reliable change was registered over time with regards to residents' opinions about the wind farm, the

percentages of objection in the sample, decreased from 14% to 6%, while those of support increased from 74% to 82%.

It appears that the findings of several authors are consistent in confirming what has been called the 'inverse NIMBY' syndrome (Warren et al., 2005), this clearly is a personal factor whose importance cannot be downplayed and that needs to be addressed by policymakers who will need to guarantee a fair treatment of the local communities most proximate to any proposed site.

1.5.5 Contextual factors

Contextual factors could denote all those factors which are factual and related with the context in which the development is happening.

In this paragraph the importance of procedural justice and participation, the co-operative scheme and other types of community ownership schemes are discussed. All these factors relate with real processes happening before the construction and have social, psychological and economic implications. Clearly the effect of these factors on acceptability is principally an effect on attitudes, therefore, also these factors could be subsumed in the category of attitudinal factors. The distinction is maintained because they refer to real processes that happen in the context of the community wind farm project and because they develop during the planning phase, therefore they present themselves as a reality to residents, rather than as a hypothetical consequence of the wind farm, whose real impact can be gauged just once it is built.

Procedural justice

Various authors advocate for a process of project development and of planning which would engage and inform the community therefore enhancing a sense of fairness leading to more favourable attitudes towards the wind farm project.

Gross (2007, p.2729) wrote: "Important elements in procedural justice include rights of participation, access to information, and lack of bias on the part of the decision-maker." Gross studied the case of Taralga in New South Wales, Australia. She interviewed twelve members of the local community about the consultation process regarding the wind farm of Taralga, a proposed development of 69 turbines. The twelve members were selected through a snowballing sampling technique and care was taken to select subjects belonging

to the supporters, opposers and undecided groups. Interviewees complained for a lack of real consultation and for the paucity of information provided. The interviewees contested the fairness of the consultation process identifying mainly three issues: 'secrecy', 'insufficient community discussion' and 'inequitable distribution of benefit'. 'Secrecy' related to the consultation process being perceived as secretive, which ties with the following complaint of 'insufficient community discussion' i.e. a lack of broad involvement of the local community. Distinguished from the previous two, which relate to the process, the third complaint instead points to a lack of equity in the outcome of the wind farm consultation process: this was presented as a "foregone conclusion" (Gross, 2007, p.2733). The author concludes that the principles of procedural justice of appropriate participation, ability to be heard, adequate information, being treated with respect and unbiased decision-making were considered important by interviewees (Gross, 2007, p.2736).

Agterbosch et al. (2009) in their qualitative case study of the municipality of Zeewolde (introduced earlier, see paragraph 'Local economic factors'), concluded that perceived fairness of the planning process and equitable benefits are important factors and that: "The building of a network of administrative and public support and collaborative arrangements, the ability of voice to be heard by local stakeholders and an adequate dissemination of information are important social conditions that add to a sense of procedural justice." (Agterbosch et al., 2009, p.404).

Specific features of a procedural justice approach have been occasionally highlighted as significant in facilitating support. Krohn and Damborg (1999) carried out a literature review of surveys about acceptability of wind energy that highlighted the importance of communication, dialogue and information in preventing opposition to wind projects. The authors cite a study (Hoepman 1998, cited in Krohn and Damborg, 1999) carried out in Friesland, Holland, in which 85% of respondents indicated that wanted to be informed of new wind energy developments and 60% thought that informing was a duty of local authorities while only 13% thought that informing was a task for the media.

In conclusion procedural fairness could be conducive of a wider acceptance of a proposed wind farm, particularly because it would give a sense of openness to the whole wind farm project, rather than something made on the back of local residents and purely for the profit of the developer.

To be invoked procedural fairness seems to require some basic elements: widely distributed information, engagement and participation of residents and a fair handling of the participation process which will not prevent an undesired outcome.

Trust towards the proponents

Trust towards the proponents and the institutional actors involved in a wind farm development has been indicated by several authors as a factor which influences levels of support (Wolsink, 2007a, Devine-Wright, 2008, Toke et al., 2008, Agterbosch et al., 2009, Jones and Eiser, 2009, Aitken, 2010, Devine-Wright and Howes, 2010).

The study of Devine-Wright and Howes (2010), presented previously in this chapter, finds a significant correlation between trust towards the developer and opposition to the proposed wind farm (-0.191, $p<.003$).

The study of Agterbosch et al. (2009) presented earlier (see paragraph 'Local economic factors') pointed to trust and procedural fairness as elements which alongside a community stake in the project could increase consent. A further study to confirm this is the study of Jones and Eiser (2009) which we presented earlier (see paragraph 'Local economic factors'): the authors carried out a hierarchical regression analysis which had as dependent variable the attitude towards the proposed development in Sheffield and which controlled for the 'general attitude' to wind variable. The variable 'trust' was obtained by a scale of six items which asked respondents regarding their trust towards Sheffield City Council which was proposing these wind farm developments. The scale had items regarding whether respondents trusted Sheffield City Council to (i) seek local opinion; (ii) take local opinion into account; (iii) keep residents views at heart; (iv) keep locals informed; (v) tell truth about any risks; (vi) act fairly when choosing a final site (Jones and Eiser, 2009, p.4609). The authors found that 'trust' was a predictor of support for the target group (residents living in areas adjacent to the proposed sites) with a standardized coefficient of 0.22 ($p<0.001$) which compared with 0.55 ($p<0.001$) of 'general attitude' towards wind.

In conclusion 'trust' appears as one of the factors influencing support but this necessarily need to be considered in the context of the other factors at stake and further research will clarify whether it has a major impact or not.

Community benefits types

Another contextual and economic factor suitable to influence local acceptability of a proposed wind farm is 'community benefits'.

Community benefits from wind energy have been the object of research commissioned by DTI (Centre for Sustainable Energy, 2005, Centre for Sustainable Energy, 2009).

Both the definitions of local community and community benefits are contested: the Centre for Sustainable Energy (CSE) (2009) notes that the locality might be considered differently if we are talking of different local benefits, e.g. a wind turbine manufacturing factory could be considered as delivering the benefit of availability of jobs on a larger scale than the communities which have the wind farm within their viewshed. Further, could we consider local jobs gains a community benefit or not? It could be that local jobs are a by-product of wind farm development but it is often an unintended one i.e. a necessary one, finally these jobs would benefit only specific subjects in the community, not the whole community. Therefore CSE (2009) only names community benefits those that can be directly influenced, i.e. purposefully disposed, and those that are supposed to benefit the whole local community and not only some individuals, these are (Centre for Sustainable Energy, 2009):

- community funds
- benefits in kind
- local ownership
- local contracting and local employment.

The same stance was not taken more recently by the Scottish Government, which instead listed the community benefits related with renewable energy developments as follows:

> "The local benefits arising from renewable energy developments can include:
>
> 1. Benefits derived from undertakings directly related to the development such as improved infrastructure,
> 2. Wider socio-economic community benefits in terms of job creation,
> 3. Benefits derived from community ownership in the development, referred …as "community investment",

4. Voluntary monetary payments to the community that are not related to anticipated impacts of the planning application usually provided via an annual cash sum, often referred to as a community benefit fund,
5. Other voluntary benefits which the developer provides to the community, (i.e. in-kind works, direct funding of projects, one-off funding, local energy discount scheme or any other site-specific benefits.)" (Scottish Government, 2013, p.7).

'Community funds' or 'community benefit funds', (whether following the CSE or SG definitions), are created by developers who pay a lump sum or periodic payments in a fund, which will benefit local residents' collective projects. In Scotland, the Scottish Government (2013) has been promoting a standard practice which expects commercial developers to deliver in a fund benefiting he local community, at least 5000 pounds per year for each MW of installed capacity, index-linked for the operational lifetime of the development.

'Benefits in kind' are provided by the developers that pay for example for local community facilities, environmental improvements or educational support.

'Local ownership' or 'community investment', (again differently labelled by the CSE and the SG), can consist in ownership of shares by local people: the shares of the project might be owned either through investment, or through a profit-sharing or part ownership scheme that ties the community benefit to the project performance.

Finally 'local contacting and local employment' are purposefully set up by the developer during the construction and operation phases.

The 'local ownership' category definition provided by CSE seems to include also co-operatives along with any other scheme which allows local residents to invest in the project. While such possibility is given voluntarily by the developer, who could have otherwise pursued a standard commercial scheme, the residents are nevertheless requested to invest to benefit from the scheme. Therefore, in this case, it doesn't seem to be present a benefit for the whole community, because some residents might not invest; further, an investment presupposes an element of risk which in itself cannot certainly be considered beneficial for the residents/investors. Therefore investment schemes should be possibly distinguished from community benefits even though the scheme is led by a developer who makes the 'kind gesture' (or interested?) of opening the scheme to local residents' investment. CSE itself after presenting the initial classification specifies further

in the same document (Centre for Sustainable Energy, 2009) that strictly speaking these investment schemes do not fit in their definition of community benefits which are such only if delivered to all the local community.

Different is the matter for local ownership which is collective and which benefits the whole community. For example, a developer could benefit a local trust, representing the community, with the donation of a number of shares of the local wind farm, or with the ownership of a turbine: therefore the trust would benefit from the revenue generated by wind farm in relation with their shares or turbine ownership; the revenue would be then spent on projects benefiting the whole community.

The Scottish Government (2013), as earlier pointed, includes "community ownership" within the list of local benefits.

In a separate document the Scottish Government (2015, p.15) lists three main options of "shared ownership", i.e., shared ownership between the local community and the developer of a commercially sized wind farm, pointing out that these options are flexible:

> "1. A joint venture vehicle can be set up, which will be part owned by both community group and developer. This may be referred to as a Special Purpose Vehicle (SPV). The community group will have the right to vote on the company's activities.
>
> • This is known as the 'joint venture' model.
>
> 2. The developer owns the development (and may set up a new private company for this purpose), with the community buying the right to a defined percentage of revenues or net revenues (after operating costs and other costs have been paid). The community does not own any shares, so is not able to vote on the company's activities.
>
> • This is known as the 'shared revenue' model.
>
> 3. The development is split into two and is owned discretely by the developer and the community group.
>
> • This is known as the 'split ownership' model."

All the three models are capable of comprising a co-operative scheme which would allow the residents to invest and have a say accordingly with the co-operative governance model and the model of ownership of the wind farm.

This paragraph made clear that there is not a unique and shared definition of community benefits; particularly, shared ownership could be seen as a community benefit or not depending on how the scheme of ownership is developed and whether it's going to benefit the whole community or just a part of it. The co-operative scheme therefore could have a role in certain types of shared ownership scheme that might divide the community between those residents who invested and those who didn't, hence it is perhaps more meaningful to think of it as an opportunity for the community to join the scheme and exert some control on it, rather than as a certain community benefit *per se*. The co-operative scheme could, if successful, benefit the community, therefore it is more of a 'potential' community benefit than actual community benefit.

Community benefits and social acceptability of renewable energy

Community benefits have been researched with regards to social acceptability of renewable energy developments and wind energy in particular, albeit limitedly to few studies. Cass et al. (2010) conducted 49 semi-structured interviews, 34 focus groups and administered questionnaire surveys across ten case studies of renewable energy developments in the UK. They found that developers were mainly moved to provide benefits by the wish of being seen as 'good neighbours' and to re-localize the benefits deriving from the renewable energy development. Nevertheless they were reluctant to adopt arguments which would acknowledge negative impacts and the right for compensation. The public appeared divided with a large number of individuals that showed suspicion or openly accused developers of attempting to bribe the local community. Nevertheless, the public often appeared to be unable to give correct details of the community benefits specifically proposed for their local development. It emerged from the focus groups an interest of the public in community benefits in the form of cheaper or free electricity, which some respondents wrongly assumed that could have been directly supplied by the local renewable development to the surrounding community buildings. Despite the scepticism towards community benefits, their questionnaire survey (Cass et al., 2010) which we introduced earlier (in the paragraph 'Opposition to wind energy') showed a strong positive correlation between perceived benefits, personally and for the local area, and project support; it also resulted that the personal and local benefits were influencing support more than any other variable which was included.

Also Aitken (2010) researched community benefits' impact on acceptability of wind farms. She studied the case of a Scottish wind farm throughout all its phases from

planning to operation: the wind farm comprises 16 turbines for a total amount of 32 MW of installed capacity and it is situated in between two small towns, one located seven miles away and the other 3 miles away; the wind farm site stretches across two councils. Aitken carried out her research in three phases: a preliminary phase in which she collected and analysed written material of various nature regarding the then proposed wind farm, which also included objection letters. The second stage was carried out through an observation of the public inquiry, which followed the initial rejection of the planning application, and a series of eleven semi-structured interviews with the actors involved in the planning process. A final phase took place after that the wind farm had been constructed which involved individuals who had been involved in the planning process and who had participated in the earlier round of interviews. The benefit scheme was early announced by the developer and sceptically received by the community of opposers' who immediately pointed to the vagueness of this benefits provision or even considered it as an attempt to bribe the community. Nevertheless the letters of objectors did not mention much this issue. Interviews highlighted that, along with the critical appraisal of some objectors, others were instead considering the offer of the developer as sensible. The developer in order to avoid the accusation of attempting to bribe the local community delayed the determination of the benefits package to the future stage in which the final planning decision had been taken. The benefits were eventually set out to be delivered in three forms: first, a fixed annual payment per MW of installed capacity, second, a variable annual payment linked to the production of energy and third a one-off payment of £75000 for energy efficiency improvements in the local community buildings. Controversies arose on who did belong to the local community affected by the wind farm; further disagreements regarded the composition of the panel of local community representatives, who were in charge of deciding which projects would have been financed, and the rules which were chosen regarding how to attribute the funding. Aitken (2010) concludes that community benefits seen as compensation are a questionable strategy to increase social acceptability and that issues of trust and procedural justice should be carefully considered. She advocates for an increased involvement of the local community in the planning process and with regards to community benefits she commends that these should be disciplined by institutionalised guidance or rules which would make them less controversial and less likely to be considered an 'attempt to bribe' communities.

In the survey of Jones and Eiser (2009) earlier introduced, (see the paragraph 'Local economic factors'), a specific form of community benefit was surveyed, i.e. the

'community trust fund'. The hierarchical regression analysis of economic benefit variables' effects on support/opposition shows that 'community trust fund' was found to be statistically significant, for the respondents of the areas adjacent to the wind farm, in influencing support/opposition, with a standardised beta coefficient of 0.10 which compared with 0.32 of 'general attitude to wind', 0.30 of 'general economic benefit', 0.13 of 'opportunity to invest and 0.13 of 'cheaper electricity'. It seems therefore that the respondents of the Sheffield study, belonging to the areas adjacent to the proposed wind sites, were influenced in their support by the possibility of a community fund but in a lesser extent than by other economic benefits.

From the literature reviewed it appears that community benefits have a positive impact on acceptability although a modest impact. Particularly, it seems that they might be contentious and they risk to be considered a way by the developer to buy consensus in the local community.

The co-operative scheme of local ownership

Co-operatives are defined as: "…independent, democratically controlled enterprises. They are owned and governed by their members, with the aim of meeting common social, economic and environmental needs." (DTI, 2004a, p.9).

In the context of wind energy, the co-operative scheme of wind farm community ownership allows local residents to buy shares of the local wind farm development and therefore to benefit from the revenue produced by its electricity generation and sale.

As stated in section 1.1, the focus of this thesis is on researching the co-operative scheme, which can be applied within different schemes of shared or full ownership of commercial wind farms, in relation with social acceptability of proposed wind farms. The reason for this choice lies in the specific characteristics of this model and precisely in its democratic governance, which entails that each member has the right to one vote irrespective of the number of shares that he might hold. Further, as earlier stated in the DTI definition, a co-operative has also "common social and environmental" goals beyond the merely economic goals pursued by regular companies, hence making it an organization particularly well placed for maximising the environmental and social positive outcomes of renewable energy generation.

This scheme is more common in other European countries, although, the country that arguably applied it the most, Denmark, seems to have it used less and less after the

nineties (Sperling et al., 2010). In fact, in Denmark, despite achieving a peak of 80% of MW of installed wind capacity owned through the co-operative scheme (2002), this proportion fell considerably to 23% by the year 2002 (DTI, 2004a). Sperling et al. (2010) explain this decrease by a combination of causes: the increased size of wind turbines with consequent increased investment cost, the diffusion of offshore wind developments and higher income insecurity.

Instead in the UK, this scheme of ownership is more recent and it has been applied also for the development of commercial size wind farms, i.e. made of not small wind turbines or not isolated turbines[8]. The UK co-operative scheme has been pioneered by Energy4All and it is often proposed as the partial ownership of a commercial development; it is realized through the creation of a local co-operative which has the purpose to raise funds from local individual investors who are invited to buy shares (Scottish Government, 2009).

Energy4all was founded in 2002 but its story starts earlier, in the mid-nineties "...when an innovative Swedish company came to the UK to establish the sort of community ownership of wind farms that was already common in Sweden." (Energy4All, 2009, p.2). The first community owned co-operative created was Baywind in Cumbria which revealed to be a successful project which, with its own revenue, allowed Energy4All to be created. Nowadays Energy4All is an organization whose purpose is to promote nationally the co-operative scheme of community ownership of wind farms. This is done by offering support to communities that express interest in the scheme. Energy4All supports the communities both in the pre-planning and the post-planning phases. In the pre-planning phase Energy4All will help the community to identify the sources of funding for this stage, called 'risk funding'; further it will provide project management assistance and will work on information and engagement of the local community. While in the post-planning phase, depending if the project is entirely community owned or not, it can guide the phase of procurement of turbines, other equipment, infrastructure contracts, grid connection, contracts for the sale of energy etc.; further, it can oversee the whole construction of the wind farm (Energy4All, 2009). In the post-planning phase a major step is the creation of the co-operative and the issuing of a share offer which might need

[8] While there is no classification of wind farms based on size, it might help the understanding of what a commercial size wind farm is by pointing out that the Scottish Government (2009) considers that many of these are now of 20 MW or more.

to be supplemented by obtaining a bank loan, if necessary, to complete the financing of the project.

Ownership of the wind farm in shared ownership cases is just partial, with the co-operative purchasing a stake in the future revenue of the project (Royalty Instrument Agreement), or through a joint venture with the commercial developer, or eventually purchasing the ownership of one or more turbines of the development. Energy4All supports also other schemes: a scheme of '100% community ownership', the 'regional co-operative model', in which the finance for the project is raised through a regional or national co-operative covering a wide geographic area and investing in several projects and finally the 'loan model' in which a community can approach an existing energy co-operative to arrange a loan to get another project started.

Shares are sold at the price of £250 while the maximum investment for an individual is £20,000 and the interest paid annually to shareholders historically ranges from 5% to 10%. While members might hold different amounts of shares, the co-operative operates on the principle of 'one member one vote'. Members have the right to elect the board that runs the co-operative and every year a third of the boards has to stand down although they are eligible for re-election.

The effect of the co-operative scheme on local wind farm acceptability was presumed positive (i.e. the scheme would increase local acceptability) by Toke (2002) who believes that this scheme has contributed to make wind energy more popular in the recent past in the Denmark. He cites (2002, p.93) a 1998 Danish report by Olesen: "One of the most important lessons from the Danish wind turbine market is that wherever co-operatives with local ownership were involved, the local population is much more in favour of the project."

In another article Toke states (2005a, p.302): "Selling shares to the general public (with preference given to local people) allows positive public relations. (....) It also has broader strategic political advantages for wind power. It creates a group of people who, having made a significant personal commitment, are likely to campaign in support of wind power."

More recently scholars (Lipp and McMurtry, 2015, Bauwens et al., 2015) have reiterated the arguments put forward by Toke and particularly Bauwens (2015) has published a study which surveyed 222 members of a wind farm co-operative called BeauVent, located in the West Flanders and an equal number of non- members, who were residents in the

Flanders. Using a matching technique, the propensity to accept wind energy in general and wind farms in the locale was estimated, resulting in a statistically significant increase of about 7% for co-operative members compared with the non-member group.

The literature reviewed therefore suggests that wind farm co-operatives might increase acceptability of wind farms but the evidence is very limited, particularly considering that the only empirical study traced was targeting on the one hand members of a co-operative of a wind farm already in place, whose perceptions might have in some extent changed over time if compared with the more delicate planning stage, and on the other hand, members of the general public who might have not faced the dilemma of supporting or opposing a wind farm in their locale.

Non co-operative local ownership investment schemes

There are other schemes of local ownership, which would imply an investment by some individuals or all the local community that might influence positively local acceptability.

A well-known example of a non co-operative local ownership scheme of a commercial sized development is the case of Fintry in Stirlingshire. In the village of Fintry in 2003 local villagers created the Fintry Renewable Energy Enterprise (FREE) with the aim of making Fintry a carbon neutral sustainable community. They envisaged an opportunity in the wind farm which was going to be developed at Earlsburn by Falk Renewables and asked the developer to agree on a scheme which would have allowed the village to own one of the wind turbines of the development. The developer agreed and accepted to finance the additional turbine through a bank loan which would have financed the whole wind farm. The agreement with FREE was that the village would have repaid the portion of the loan, regarding the additional wind turbine, during the fifteen years of operation of the wind farm (Centre for Sustainable Energy, 2009, Scottish Government, 2009).

It was possible to trace only three studies researching social acceptability of wind farms which bear an element of community ownership and investment: two of them regarding wind developments smaller than currently common commercial sizes.

One, of Maruyama et al. (2007) investigated the motives behind the choice to invest or not in community funded wind farm developments in Japan. The wind farms studied were small and comprised single turbine developments, with outputs between 1 and 1.5 MW, in three locations (Hokkaido, Aomori and Akita). The authors surveyed 4 groups of individuals: investors in the Hokkaido wind turbine, investors in the Aomori prefecture

wind turbine, investors in the Japan Green fund, whose finances would support the turbines in the Aikita and Aomori prefecture, and finally a group of non-investors who had originally expressed an initial interest in the Aomori or in the national fund. Written questionnaires were used to survey respondents in 2003 and 2005. Factor analysis was performed on eleven questions aiming to clarify the interest of respondents in the wind community developments; three factors were identified: the first, called 'environmental movement' aggregates the beliefs that environmental collective action is needed, the second called 'commitment factor' expresses the wish to participate in community owned wind energy but limited to economic participation, which is easier to enact than actively engaging in an environmental movement. Finally the third factor, 'economic factor', expresses the wish of an economic participation that is not a donation and that delivers a dividend. Multivariate analysis of variance MANOVA was performed on the average scores of the three factors used as dependent variables. The results showed that factor number 2, expressing the wish of participating in community owned wind projects, was relatively high among investors in the Aomori turbine but not among investors in the Hokkaido turbine or investors in the Japan fund: in both these two last groups of investors, the factor having the highest value is 'environmental movement' which instead has a negative value in the Aomori case. The authors (Maruyama et al., 2007) explain the difference with the difference in social context in which the three collective funding initiatives have developed.

Another study by Warren and McFayden (2010) compares the Scottish cases of the Isle of Gigha and the peninsula of Kintyre in the Argyll and Bute council area. The Isle of Gigha, was bought by its own community in 2002 and it's now owned and managed by a development trust, the Gigha Heritage Trust. Islanders decided to invest in wind energy and set up in 2005 a small wind farm comprising three pre-commissioned 225kW wind turbines which amount to a total installed capacity output of nearly 0.7 MW. The scheme was financed through a mix of grant funding, loan finance and equity finance (The Isle of Gigha Heritage Trust). The Isle of Gigha case was compared with the nearby case of Kintyre where at the time of the study three commercial wind farms were operational and two were under construction. The size of the developments on Gigha and Kintyre is extremely different: the total capacity installed at the time of the survey on the Kintyre peninsula was 58.6MW which would have risen to 102.6MW once the two wind farms under construction would have been completed. Therefore the visual impact on Kintyre was significantly higher than the one on Gigha. Warren and McFayden, surveyed Gigha

and Kintyre residents and tourists: they both run a questionnaire-based survey which counted on 106 respondents and supplemented these with face to face interviews with five stakeholders. Local residents amounted to 68 respondents, 24 were based in Gigha and 44 on Kintyre, while the tourists were 38. The questionnaires were partly administered face to face, 61%, and partly were completed on line, 39%: the online questionnaires were advertised on local press and a regional web-based discussion forum. Residents' opinions show that the Gigha respondents were consistently more positive about wind power in general and about the local wind developments. Amongst Gigha's residents 96% supported increasing wind energy developments in Scotland versus 68% in Kintyre. Residents in Gigha also showed more support of increasing wind farms in their local area, 75%, while this proportion was lower in Kintyre 64% while more opposed this option in Kintyre 12% and less in Gigha 8%. The authors did not provide correlation statistics to ascertain if the area of belonging (Gigha or Kintyre) were influencing the support for wind in general or for more wind farms in the local area. Further the authors themselves accept the criticism of comparing very different local areas in terms of size of wind farm developments. A final criticism which could be highlighted is the sampling choice: non-probabilistic sampling was used and respondents would have been self-selected at least for the case of on line questionnaires.

The third study (Jones and Eiser, 2009, earlier introduced in paragraph 2.1) considers the 'opportunity to invest' within the investigation of factors leading to the support/opposition of four proposed wind farms in Sheffield. The regression analysis of the positive economic benefit variables controlling for the 'general attitude to wind' variable, shows that the variable 'opportunity to invest' has a positive effect in influencing support with a standardised beta coefficient of 0.13 which is nevertheless smaller in magnitude than the effect of another statistically significant economic benefit variable, specifically 'general economic benefit' 0.30, while it compares equally with 'cheaper electricity' 0.13 and shows a larger effect than 'community trust fund' 0.10.

From the limited research reviewed, it appears that community energy owned projects can have a positive impact on the community and could possibly increase the acceptability of wind energy. Again, it has to be assumed that local investment by residents, if necessary to raise funds, might be a divisive process, nevertheless other opportunities to raise funds can be pursued, especially for small developments.

1.5.6 Conclusions of chapter one

In this chapter was presented a literature review performed over a number of years and specifically divided in two parts, one developed before the first empirical study, which is presented in chapter three, and one carried out before the second empirical study, presented in chapter four.

The categories proposed to present the main factors influencing participation in wind farm co-operatives and presented in figure 4, (in section 1.4), specifically ‘attitudinal or psychological factors’, ‘personal factors’ and ‘contextual factors’ were used throughout section 1.5 to organize the specific factors that were treated more in depth, recalling the then published empirical studies about social acceptability of wind farms.

It emerged that often scholars agreed in including these factors within the set of issues leading to acceptability of wind farms, although their relative importance was not fully agreed. Certainly some stand out and particularly the environmental impact on the local environment, (mainly the visual but not exclusively), economic considerations, the socioeconomic status of respondents and their distance from the proposed site.

In the next chapters these factors, along with the specific theme of participation in a local wind farm co-operative scheme, will inform the research questions, the research design and the data collection.

2 Chapter 2 Research design: methods and data collection

2.1 Research questions

The co-operative scheme appears as a suitable instrument to achieve a democratic engagement of the public in the energy sector. This could be seen as part of a wider process of renewal of the democratic system through citizens' engagement in associations as advocated by Hirst (1994, 2002). Dobson (2003) explored the meanings of the environment in relation with the concept of citizenship, which ultimately regulates the interaction between citizens and the public goods, such as the environment itself, through the balance of citizens' rights and duties. The environment emerges therefore as one of the arenas of the democratic public debate in modern democracies.

In this context, Rifkin (2002) could see energy co-operatives as a means to lead people to gain control over the energy system, therefore producing a better and more equal distribution of wealth. In the specific context of wind power, Toke (2002) suggested the possibility that wind energy co-operatives could achieve the objective of reducing and possibly overcoming opposition within local communities facing the perspective of hosting in their vicinity a wind farm.

Considering these theoretical premises, it appeared significant to point our research towards the attempt of filling a gap in literature regarding the object of the co-operative wind farms. Hence, four research questions were generated:

1. Which factors do influence acceptability of wind farms? How do they relate to one another?
2. Which factors do influence participation in wind farm co-operatives? How do they relate to one another?
3. Is the co-operative scheme effective in eliciting participation of local communities and in overcoming opposition toward wind developments? Why?
4. Do individuals perceive their status of citizens as a source of moral obligation to protect the environment? (In other words: Is environmental citizenship perceived as a source of moral obligation to protect the environment?)

Research questions number 2, 3 and 4 appeared still largely unaddressed by the scientific community at the time in which the literature review was carried out. Albeit more recent

research (Walker, 2007) sheds some light on the wider phenomena of community energy projects and community ownership of wind farms (Warren and McFadyen, 2010), still, none seems to have addressed either the specific case of wind farm co-operatives, or how the concept of citizenship relates to the environmental debate on wind farms and their acceptability. Research question number 1 has been instead researched for a long time, although it seems that different studies have focused on specific factors without achieving a comprehensive explanation of opposition to local wind farms.

2.2 Research design

Research in this PhD project was conducted with a multi-method approach otherwise called triangulation (Jick, 1979). Triangulation was defined by Denzin as "the combination of methodologies in the study of the same phenomenon" (in Jick, 1979, p.602). Robson (2002) points clearly to several advantages of using a multi-method approach as: reducing the errors that could be implied in a mono-methodological approach and the efficiency in tackling different research questions and targeting different subjects. Although Robson shows to be aware of the potential theoretical criticism that social scientists could face combining methods traditionally belonging to different theoretical traditions, still he maintains that this integration could enrich the efficacy of social research in representing the object of investigation. On the same note Jick (1979, p.602) states "...researchers can improve the accuracy of their judgments by collecting different kinds of data bearing on the same phenomenon."

The feasibility of the data collection was assessed through a search of suitable case studies in the United Kingdom.

Cases studies are widely used in social science to achieve in depth knowledge of a unit of analysis (being this an individual, a group, an organization, a geographical entity etc.) (Robson, 2002). Researching the peculiar characteristics of a case study, provides the opportunity to expand scientific knowledge deepening the understating of how a wider social phenomenon is altered by such characteristics at the same time accounting for the contextual conditions in which the case is embedded (Yin, 1981, 2003). In this case for example the social acceptability of a wind farm could be altered positively, in hypothesis, by the adoption of a co-operative scheme offering the ownership of the project to local residents.

Certainly, the adoption of a case study is going to limit the generalizability of the results. In fact, results might be generated by the specific characteristics of the context of the case study. For example: the output of a local debate around a proposed wind farm might be influenced by the co-operative scheme proposed, which is the feature of scientific interest, but also by other specific characteristics of the community, such as the average income and education in the area, or the presence of a local tourism industry etc. Yin points that case study research does not aim to generate a theory generalizable for the whole population but rather to "generalize findings to the theory analogous to the way a scientist generalizes from experimental results to theory." (Yin, 2003, pag.38). In this way a theory evolves through subsequent contributions based on empirical studies and it is held as externally valid once a considerable amount of empirical research has confirmed it, or better said, it has not falsified it (Popper, 1990).

The choice of limiting our attention to case studies in the United Kingdom was due to practical and theoretical reasons. The former is due to constraints of time and financial resources. While for the latter, because of our interest in considering the relevance of the community owned co-operative scheme for the United Kingdom it made sense choosing UK cases of study only. In fact we thought that the United Kingdom had a different and peculiar context of public debate where for example the concept of social enterprises and co-operatives might have assumed a symbolic meaning for the public rather different than that they could have had in a northern European social-democracy such as Denmark (DTI, 2004a), the example highlighted by Toke (2002). Similarly we could argue about the difference between the United Kingdom and Denmark in public views regarding the countryside or in conceptualizing citizenship collective action beyond the political arena. For example, in the United Kingdom the cultural theme of the "rural idyll" (Woods, 2005) might mean more resistance to any significant human made modification of the rural landscape. This is even more true if, like Woods (2005, p.4) say, the rural idyll contributed to the myths of identifying the UK national identities with the countryside.

2.2.1 First study

The case study chosen for the first study was Westmill Wind Farm (in Watchfield, Oxfordshire), which, at the time of our review of case studies, appeared to be the first wind farm co-operative aiming to be owned entirely by the local community.

A considerable amount of local debate was stirred by the initiative but at the stage of the data collection the share offer was not already open. Hence local residents were still waiting to go through a later stage of debate that would have provided them with further information about the project and particularly regarding its financial side. This was one of the reasons that led us to target in our data collection stakeholders such activists, members of not for profit organizations, which opposed or supported the project, and members of local authorities present in the area. They had already stable views on the project and could also report easily about the perceived levels of support that the project was attracting and particularly about the contextually significant benefits and costs perceived locally with regards to the wind farm. In fact, some of these subjects were promoting public initiatives in support and opposition to the project that were aiming to involve local people, or as elected members of local authorities they were sensitive and exposed to the views of citizens in their constituency. Further, the vast majority of respondents were living in the area, which is made of few villages, hence making likely for them to have a sense of what were the opinions of residents about the wind farm proposal.

Finally, stakeholders seemed also the best subjects to provide significant opinions regarding the topic of environmental citizenship. Being themselves engaged in the forefront of the debate, or being in the middle of it as members of local authorities, they appeared in the optimal position to answer questions regarding environmental citizenship and in general the relation between citizenship and the environment.

The subjects were recruited after identifying them mainly through a report produced by the Thames Valley Energy Agency (TV Energy, 2004), they were then contacted and invited to participate in interviews, achieving eventually a group of volunteers with a fairly equal representation of supporters, opposers and local authority and parish council representatives. The total number of individuals surveyed was 14, of which 11 were interviewed face to face while the remaining 3, not being available for face to face interviews answered a questionnaire bearing the same open questions that were posed to all the other interviewees.

Data was collected mainly through semi structured interviews. In appendix B the interview guide is presented along with is rationale.

Being the population of stakeholders quite limited, it seemed possible to represent their views through interviews. Interviews for their own nature do not afford a large sample, unless a large number of interviewers is participating to the project.

Robson (2002) highlights the flexibility of the qualitative design which allows an inductive approach to empirical research (Corbetta, 2003). The topic of this thesis was novel and the literature review could only encompass themes related with the object of research like pro-environmental behaviours and participatory behaviours, hence it made sense to adopt an open or flexible research design that could leave some space for new theoretical concepts to emerge from a first empirical stage of the research process.

Hendwood and Pidgeon (1994) distinguished between 'empiricist', 'contextualist' and 'constructivist' epistemologies in qualitative research, highlighting the differences in the way these different approaches treat qualitative data. In the case of the 'empiricist' approach data is used to verify hypotheses; within the 'contextualist' approach instead, data is used to generate new theory in an inductive process mastered by the researcher; finally in the 'constructivist' approach the researcher focuses on discourse and how discourse constructs reality, being this intended as both the object and the subjects involved in the research process.

In this research the chosen position has been close to both the 'empiricist' and the 'contextualist' approaches: it was considered that the inductive research process enabled by the qualitative approach is a valuable tool to generate empirically based theory. This can arise from both the testing of pre-existing theoretical stances elaborated by the researcher or other scholars, or by an original contribution of the researcher, who is prompted by the data collected to fill a theoretical gap that explains with newly conceived theory data otherwise left unexplained by preceding unsatisfactory theories.

2.2.2 Second study

The second study was informed by the first study and by an update of the literature review.

It was thought that this second stage of data collection should have surveyed local residents, living close to proposed wind farms, in order to assess how the co-operative scheme could have influenced the acceptability of the proposed wind developments.

A quantitative study would have attributed a quantitative measure to different factors that were believed to have an influence in shaping acceptability of wind farms and particularly

of wind farm co-operatives. With this purpose in mind it was chosen to carry out a postal survey, which appeared to be the only means of research which could have allowed a single individual to survey a relatively larger amount of people in relatively distant rural areas within the time frame and financial resources of the PhD project.

The limits of postal surveys have been pointed out by several authors (e.g. Wallace, 1954, Robson, 2002, Corbetta, 2003). Just to mention some of the most evident (Corbetta, 2003): the problem of self-selection of respondents, with those who accept to engage who might have higher education or a subjective interest in the topic, the problem of a different respondent from the one requested by the researcher filling the questionnaire, the higher risk of having a low return rate, the necessity of keeping the questionnaire as short and synthetic as possible, while making it attractive and easily understandable, the isolation of the respondent who doesn't have the ready availability of the researcher in case he/she doesn't understand a question. Finally the generic limitations of the quantitative approach (Bryman, 2004) apply also in this case. Particularly, we might lose sight of contextual characteristics of the surveyed wind farms, or omit to survey residents about some local factors leading to opposition or support that might have been unwittingly overlooked.

The advantages instead are mainly of a practical and economic nature, but it is also worth to mention that the absence of the interviewer can obviously exclude any influence by this on the respondents and their answers beyond the one exerted through the way in which the questionnaire is laid out (Corbetta, 2003).

It would have not been possible to survey the whole British population living close to all the proposed wind farms in the UK. Just the sampling would have been extremely laborious and time consuming: at the time of planning the work (October 2010) the RenewableUK website[9] reported 261 wind farm projects in planning across the country.

Financial constraints were also an issue, even though this was a secondary one in influencing the choice of a questionnaire survey design targeting four specific cases of study.

Four Scottish cases of proposed wind farms were chosen, the reason being the present and future relevance of Scotland for wind energy production in the UK. In fact, Scotland holds about 60% share of total MW capacity of UK wind farms operational, in construction or consented and about 56% share of the total UK MW capacity of wind

[9] www.renewableuk.com

farms in planning[10]. Therefore it makes sense, if the UK is to achieve its renewable energy target, to expect that the major wind energy contribution will come from Scotland and therefore social acceptability of Scottish wind energy will likely be one of the issues affecting a successful wind energy deployment strategy.

Certainly, the critical moment in terms of social acceptance is during the planning period when the proposal is brought to the attention of the local population. Research has shown that opposition is larger before the construction of wind farms and that this weakens after construction (Warren et al., 2005). Further, opposition before planning permission is consented is the only period when opposition can have a chance to influence the planning process.

Hence, the proposed wind farms of Bracco in North Lanarkshire, Meikle Carewe in Aberdeenshire, Cushnie in Aberdeenshire and Nigg Hill in the Highland council areas were chosen. These four specific cases were chosen because it appeared sensible to compare co-operative schemes with commercial schemes, both in high income and low income areas. The reason for this choice was the outcome of study one in which income was identified as a personal resource suitable of possibly altering the perception of the benefits deriving from a proposed local co-operative wind farm, something that is in agreement with the literature presented in chapter 1, section 1.5.4.

This research was interested in wind farm projects which by size would have been comparable with current commercial developments, mainly because it is this size of wind farms that commonly becomes locally controversial.

Given these conditions, only a few proposed wind farm co-operatives could be found through the website of Energy4all[11], (a UK co-operative promoting wind farm co-operative schemes in the UK). At the time when the cases were selected, only Cunshnie, Dunbeath and Nigg Hill wind farms were listed as wind farm projects bearing an element of community co-operative ownership. This meant that they were not going to be fully community owned but only partially, through a co-operative scheme. Considering the difficulty of realizing a development of a commercial size which could possibly be completely locally community owned, it was not surprising to see that no such project was proposed in Scotland.

[10] Data elaborated from statistics from RenewablesUK, available from: http://www.bwea.com/statistics/ Accessed on 14/10/10

[11] Web site: http://www.energy4all.co.uk/scotland/scotland_home.asp last accessed on 14/10/10.

The difficulty of gathering locally the funds to finance a wind farm of considerable size was experienced by the Westmill project too, which was surveyed in the first study. During the sale share the project benefited from a considerable amount of funding paid in by The Midcounties Co-operative (formerly Oxford, Swindon & Gloucester Co-op), which bought 75000 shares (Westmill Co-operative, 2006a) and is the largest shareholder, a business which is considerable as local, but which cannot be considered part of the community of local residents. Further, the share sale prospectus did not pose a geographical limitation to investors, only in the case that the share sale would have exceeded £3.75 million, the investors within 50 miles from the wind farm would have had preferential access to the shares (Westmill Co-operative, 2005). This condition was effectively achieved but being announced that the share sale achieved "over £4 million", it was said that some applications would have been "scaled back", therefore implying that a vast number of applicants non-resident within 50 miles from the site would have had their applications accepted (Westmill Co-operative, 2006b).

These difficulties in raising local funds for locally owned wind farm co-operatives has been also highlighted by a report on wind farm community schemes financing (TLT Solicitors, 2007) which considers this to be a weakness of the co-operative model. The partial community ownership through a co-operative scheme is anyway still a way to allow the local residents to join in and benefit from the scheme giving them the feeling of being part of the ownership.

Of the three schemes mentioned earlier it made sense to select the two of them which were respectively the most affluent and the least affluent. At the same time the four Scottish cases would have needed to have as much as possible a comparable size of development, in terms of proposed installed capacity. Dunbeath was therefore ruled out principally because of the size of the proposed development which is expected to have 23 turbines providing an installed capacity of 69 MW (West Coast Energy, 2005).

While the size of the other cases Cushnie and Nigg Hill is respectively of 7 wind turbines for a total installed capacity up to 21 MW (Falk Renewables, 2008) and 5 wind turbines with an installed capacity up to 12.5 MW (Falk Renewables, 2010).

For the choice of the commercial case clearly it was available a much larger population to choose from. It was proceeded selecting the areas of Scotland that appeared to be the most income affluent and the most income deprived of Scotland. This was done using the

interactive map[12] of the Scottish Index of Multiple Deprivation of the Scottish Government which was set to show the areas of income deprivation at data zone area level, coloured differently from red, highly deprived, to blue, highly affluent, presenting different tones of colour depending on the vigintile of ranking to which the area belonged. In this way it was possible to identify the most deprived (and affluent) areas and looking at the RenewablesUK online map[13] of wind farms in planning, it was possible to choose the most suitable wind farms to be considered for the study.

The case that was identified as the most income deprived was the proposed Bracco wind farm in North Lanarkshire, a development seeking consent for establishing a power plant of 7 turbines with a total generating capacity of 21 MW.

Identifying a wind farm place in an income affluent area was more difficult, being wind farms in rural areas and being the most affluent areas of Scotland located in urban areas. Eventually it was chosen the case of Meikle Carewe wind farm in Aberdeenshire, which is proposed to be a development with 12 wind turbines for a total generating capacity of approximately 10 MW.

In table 2 a summary of the proposed wind farm cases is presented. Along with the technical and geographical data regarding the proposed wind farms, i.e. number of turbines, total MW of capacity, the local authority which they belong to and the area average of the urban/rural classification of the Scottish Government, it is also presented social data regarding the levels of income deprivation and multiple deprivation.

[12] Available at http://simd.scotland.gov.uk/map Accessed on 16/10/10
[13] Available from: http://www.bwea.com/ukwed/google.asp Accessed on 16/10/10

Name WF	Local authority	Turbines	Total MW	Type of scheme	Average % of income deprived	Average SIMD rank	Average urban/rural classification
Meikle Carewe	Aberdeenshire	12	10	Commercial	5.00	5414.78	2.91
Cushnie	Aberdeenshire	7	21	Co-op	6.15	4972.03	6
Nigg Hill	Highland	5	10	Co-op	15.86	2892.39	5.16
Bracco	North Lanarkshire	7	21	Commercial	18.09	2162.58	1.82

Table 2 - Cases chosen for the quantitative postal survey

It was considered principally interesting the financial wealth parameter of deprivation of local communities, because this emerged in the qualitative study as possibly being a factor influencing levels of opposition.

Therefore it was decided to rely on the data of the percentage of population income deprived[14] at data zone level supplied by the Scottish Neighbourhood Statistics Programme[15] (SNSP) for the year 2008. The areas surveyed covered several data zones, sometimes just partially, therefore, it was necessary to select the data zones whose data had to be included in the calculations of the percentage of income deprived population of the areas surveyed. The data zones, fully comprised in the surveyed areas were selected, along with those only partially covered, which nevertheless had the vast majority of their settlements in the area surveyed. It was judged visually, looking at maps if and how many settlements of a partially comprised data zone were part of the area surveyed.

[14] The percentage of 'population income deprived' was calculated including the data regarding these categories of citizens:

- Number of Adults (aged 16-59) receiving Income Support (Department for Work and Pensions (DWP) April 2005)
- Number of Adults (aged 60 plus) receiving Guaranteed Pension Credit (DWP May 2005)
- Number of Children (aged 0-15) dependant on a recipient of Income Support (DWP April 2005)
- Number of Adults receiving (all) Job Seekers Allowance (DWP April 2005)
- Number of Children (aged 0-15) dependant on a recipient of Job Seekers Allowance (all) (DWP April 2005)
- Number of Adults and Children in Tax Credit Families on low incomes (HMRC August 2006) For further details see: (Office of the Chief Statistician, 2009)

[15] Data available from: http://www.sns.gov.uk/default.aspx Accessed on 19/10/10

Unfortunately it was not possible to source any detailed data regarding population numbers of these specific settlements.

Once selected the data zone the estimates of the population for the year 2008 of each data zone, made available by the SNSP, were used to compute with the percentage of population income deprived for the same year 2008 an average percentage of population income deprived for the area surveyed around each wind farm, which is presented in table 2.

For the purpose of illustrating better the social context of the areas surveyed it was also calculated the average 2009 SIMD[1617] rank of the areas surveyed. To do so it was computed the rank values of the SIMD 2009 and the population estimate values of 2008 both at data zone level, which are made available by the SNSP[18].

The SIMD is a rank therefore it just says if an area A is more or less deprived than the area B. It cannot be said, for example, that if B has a rank value of 4000 then its level of deprivation is half than the area A that has the rank value of 2000. Nevertheless, doing an average of the SIMD ranks of the data zones comprised in each of the areas surveyed can tell us if e.g. the area surveyed around Bracco is more deprived than the area surveyed around Meikle Carewe. The results of these 2009 SIMD ranks averages are presented in table 2.

It can be noticed from the data presented that both the percentage of the population income deprived and the SIMD 2009 ranks are in agreement, i.e. present the same hierarchy of deprivation that ranges through from the least deprived Meikle Carewe to Cushnie, Nigg Hill and finally Bracco, the most deprived.

Another difference that deserves to be noted is that Bracco wind farm is the only one of the areas surveyed which has its settlements close to a large city, Glasgow, and relatively close to a second city, Edinburgh. This location makes the environments surrounding Bracco only partially rural, with most of the area surrounding the proposed wind farm

[16] The SIMD rank varies from 1 the most deprived data zone to 6505 the least deprived. For more details see the endnote 'iv'.

[17]From http://www.sns.gov.uk/ (accessed 25/10/10): "The Scottish Index of Multiple Deprivation (SIMD) provides a relative ranking of the data zones in Scotland from 1 (most deprived) to 6505 (least deprived) based on a weighted combination of data in the domains of Current Income, Housing, Health, Education, Skills and Training, Employment and Geographic Access and Crime (SIMD 2006 onwards). Each of the domains can also be ranked individually. More information (including a guidance leaflet, a general report, a statistical compendium and a technical report) can be found atwww.scotland.gov.uk/simd. An SIMD interactive mapping website is available from www.scotland.gov.uk/simdMapping."

[18] Data available from: http://www.sns.gov.uk/default.aspx Accessed on 19/10/10.

that can be defined as urban or semi-urban. This is confirmed by the urban/rural classification[19][20] that the Scottish Executive provides of the Scottish data zones. If we look at the area surveyed around Bracco's proposed site, we find a mean of urban-rural classification of 1.82 with just few data zones classified 5, 'accessible rural' and 6 'remote rural'. For the area of Cushnie the mean is 6, so all the data zones, within the area surveyed, are classified as 'remote rural'. For Nigg Hill the average is 5.16, which again means a high prevalence of rural areas and for Meikle Carewe is 2.91, so in this last case we have an area surveyed which presents an almost equal number of urban and rural areas.

Pilot study

It was carried out a pilot study of the survey which targeted the case of Aikengall II, close to Dunbar, in Scotland. It was decided to survey the case of Aikengall II because was a case in a relatively affluent area which could have been part of our final group of case studies. Eventually it was decided against including Aikengall II because was too close to a pre-existing wind farm and because the proposed development was too large in comparison with the other cases that were being selected.

Eighty households were selected randomly within two bands of 0-5 km and 5-10 km from the designated site. Various authors highlighted the influence of distance in shaping the wind farm attitudes (Braunholtz and McWhannel, 2003, Warren et al., 2005, Bishop and Miller, 2007) and at least two studies reviewed (Braunholtz and McWhannel, 2003,

[20] From http://www.sns.gov.uk/ (accessed 25/10/10): "The data zones have been assigned to the 6-fold classification. Each data zone has been assigned to the category of the classification for which the majority of its census output areas lie. Data zones were not designed to nest within the urban rural classification and as a result some data zones do straddle the urban rural classification. A measure of the effect of straddling can be determined by the percentage of output areas which are assigned to the same category under the data zone classification and the census output area classification: The Scottish Government Urban Rural Classification (previously called the Scottish Household Survey Urban Rural Classification) was first released in 2000 and is consistent with the Scottish Governments core definition of rurality which defines settlements of 3,000 or less people to be rural. It also classifies areas as remote based on drive times from settlements of 10,000 or more people. ....The classification has been designed to be simple and easy to understand and apply. It distinguishes between urban, rural and remote areas within Scotland and includes the following categories: Scottish Governments Urban Rural Classification 1 Large Urban Areas Settlements of over 125,000 people. 2 Other Urban Areas Settlements of 10,000 to 125,000 people. 3 Accessible Small Towns Settlements of between 3,000 and 10,000 people and within 30 minutes drive of a settlement of 10,000 or more. 4 Remote Small Towns Settlements of between 3,000 and 10,000 people and with a drive time of over 30 minutes to a settlement of 10,000 or more. 5 Accessible Rural Areas of less than 3,000 people and within 30 minutes drive of a settlement of 10,000 or more. 6 Remote Rural Areas of less than 3,000 people and with a drive time of over 30 minutes to a settlement of 10,000 or more. Further information on the urban rural classification can be found at www.scotland.gov.uk/urbanrural."

Warren et al., 2005) considered the 0-5 km and the 5-10 km bands of distance as a useful partition of the local area for research purposes.

The questionnaire mailed was 4 pages A4 long and it was printed on all the 8 sides. Several ranking questions, i.e. questions requiring the respondent to rank the two or three items considered as the most important within a larger group of several items, were included in the questionnaire.

The questionnaire was first mailed with a letter and after two weeks a reminder letter was sent offering to deliver a further questionnaire on request if the first was lost.

A response rate of 17.5% was achieved. From the returned questionnaires, it appeared that some of the ranking questions were often not filled or filled in the wrong way, this led to eliminate ranking questions from the questionnaire and to limit almost all the items to 5 point Likert scale questions. The final questionnaire for the administered postal survey and the changes consequential to the pilot study are presented in Appendix A and further discussed later in chapter 4.

Sample determination

After reviewing the work of Bartlett et al. (2001) on sample determination in survey studies and after reviewing the source (Cochran, 1977) of their recommended statistical formula of sample determination, Dr Helen Brown, Senior Statistician at the University of Edinburgh[21] was consulted.

The formula proposed by Cochran (1977) and cited by Bartlett et al. (2001) for continuous variables that are researched through a survey design is:

$$No = [(t)^2 * (S)^2] / (d)^2$$

Where *No* equals the sample number of subjects to be selected; *t* is the t value corresponding to the probability of committing a type I error (the null hypothesis is rejected but it is right), also called α (alpha) level, while *S* stands for the standard deviation of the main variable which the study is looking at; and finally *d* is the acceptable level of error for the mean of the variable being estimated.

[21] Dr Helen Brown, AQMeN, University of Edinburgh, Room 2.36, 15 Buccleuch Place, Edinburgh, EH8 9LN, Tel. 0131 650 2921.

This formula was amended after the advice of Dr Brown because the study had a two group design, affluent/ deprived, co-op scheme/ commercial scheme, which should have been reflected in the formula of sample determination. Further, to increase the accuracy of the sample determination also the 'power', 1-β, which is the probability of avoiding a type II error, β, beta, (i.e. the null hypothesis is accepted but it is wrong) is included in the formula. In this study sample calculation power was conventionally set at the level of 80%.

Therefore if the true difference in mean opinion is 0.5 then the number given by the formula would provide an 80% chance (power) of detecting a statistically significant difference between groups at the 5% level.

$No = [(t + z)^2 * 2 * (S)^2] / (d)^2$

With t = 1.96, z = 0.84, the standard deviation of the variable 'opinion on the wind farm' obtained from the pilot study is S = 1.157 and the acceptable level of error d = 0.5

Then No = 84 which is the number needed of each group co-operative/ commercial and affluent/ deprived

Therefore the total sample size is No*2 =168.

It was deemed as achievable a response rate of 20%, considering that the pilot had a response rate of 17,5%, and that the pilot questionnaires were sent out over the Christmas period and finally that for the pilot the questionnaire was 2 pages longer and more complex.

Therefore with a 20% return rate it was necessary to mail 840 households to obtain the 168 returned questionnaires needed. As a form of precaution it was decided to email 1000 questionnaires, therefore 250 for each of the chosen proposed wind farm areas.

3 Chapter 3 Analysis of the qualitative study

The following sections present the analysis of the qualitative data collected. Once the interviews were conducted and digitally recorded, the material was fully transcribed and Nvivo software was used to code significant excerpts. The guiding principle of interviews coding was to develop a non pre-determined number of codes which would have allowed to link the excerpts of respondents' answers to single research questions. The excerpts so identified are here reported and commented in relation with the literature earlier presented.

3.1 Citizenship, environmental citizenship, responsibilities and rights

3.1.1 Citizenship

The majority of respondents asked about the concept of citizenship (question n. 2: Have you ever come across the concept of citizenship? What does it mean to you?) showed a loose understanding of the concept, (as shown below), although some dismissed the question as too philosophical or irrelevant and just one of them made an explicit link with the environmental subject, although being in this case a written response, it could have been addressed by the availability of the questionnaire to be read in advance. An example of the understanding of the concept is provided by the leader of an environmental charity that supported the project:

Excerpt 1

GP[22] What is the meaning that you attribute to that word? (Citizenship)[23]

R The meaning, ehm citizenship means the role that you play in society, you know what society can do for you and your responsibilities within a community.

Often the responses identified in the concept of citizenship both the two main dimensions of rights and duties belonging to the citizen status (Reeve in McLean and McMillan, 2009), although the theme of responsibility was more often present. This is clear in the answer of the head of a local Parish council:

Excerpt 2

[22] In the following excerpts, GP stands for the initials of the interviewer, while R means respondent.
[23] Parentheses are used to enclose words that were transcribed despite they were not clear.

GP ...or of your Council, in particular, I would be happy to you to highlight this because could be useful for me. So being a councillor of course you deal with the concept of citizenship on a daily basis, what does it mean this concept to you? The concept of citizenship.

R In relation to what we try to do in the village, I suppose, my own view is one of almost self-governance, is that in a village situation, you quite often get people saying they have seen someone dropping litter or they've seen someone doing something wrong and they come to the Parish Council and they say "you ought to do something about it" and, you know, what we say is, "well actually you ought to do something about it because you 'are as much a citizen of the village as any others' " and so it is a little bit of encouragement to self-governance really.

Citizenship at different geographical levels and conflict

Citizenship was defined mostly as the membership to the national community or society in general. In only two cases the belonging to an international community was mentioned and in just one case the local community was named. Although this could appear less important than the common identification of rights and duties, it seems to be of primary importance because it may evidence conflicting priorities between different conceptions of citizenship, hence motivating substantially different behaviours: for example support or opposition to the wind farm.

Dobson (2003)makes clear the difference between environmental citizenship and ecological citizenship, conceptualizing a dual level of spatial foundation for these memberships. In the first case, 'environmental citizenship', the nation state is the reference unit that defines the rights and duties towards the environment while in the second, the case of 'ecological citizenship', this is defined as non-territorial. In this second case Dobson refers to citizenship that goes beyond the formal public sphere and refers to the private sphere too (Dobson, 2003, p.39).

Ecological citizenship is beyond the formal sphere and is a matter of subjective perception, the feeling of belonging to the world society or to the planet. This emerges clearly from several interviews where respondents made explicit reference to a sense of responsibility originating from the belonging to the planet, or the world society, although they usually did not link this with their concept of citizenship, as stated earlier, for examples see Excerpts 3, 4, 5.

A member of the wind farm opposers' group said:

Excerpt 3

GP So we are talking about carbon dioxide and the production is the result of human activities, within our society do you think that we are all equally responsible or there are some sector of society that are more responsible, what do you think about responsibility within society in general, is it an equal responsibility or not?

R Well, we all share planet earth, our base of living, so in that sense we all have responsibility to do what we can to keep it in good condition, and certainly we have serious responsibility not to arm our environment in a wilful manner, (.)[24] *perhaps those are strong words, in some parts of the world, an impoverished human community will engage in what is called slash and burn practice, destroying forests in order to create some lands on which they can grow crops for their food, and I understand that their conditions of life are very much impoverished these compared to mine and I hesitate to blame them, but of course they are engaged in a practice which is harmful to our environment, and if we can find some way to avoid them doing this, I think that would be good.*

Here is speaking a former Parish and District councillor:

Excerpt 4

GP In your views what is or who is responsible of climate change especially in our national society, are there any sector of the society that you think are more responsible or the responsibility is widespread across the citizens, what is your view?

R I think obviously the government has got to take a lead in any sort of moves that is going to take place because after all the government is there to represent the people and should be capable of having a longer view of the world and our environment and our society than you know the ordinary citizen in the street, I think the government has the main lead responsibility but I think following on from that there are other stakeholders, I think business, is an important stakeholder because they have got to behave responsibly and they have got to develop processes that are environmentally sensible and at the very least don't do any harm to the environment even if they don't help it and I think as individual we all have a responsibility because we all leave in the planet and I think that

[24] The use of (.) means the presence of a word that was not clear enough to be transcribed.

is responsibility for each of us to do what we can, you know, to help the planet if not to become more safe than at least to become no more dangerous than it currently is.

The member of a renewable energy agency that supported the wind farm:

Excerpt 5

GP You mentioned environmental values but at the same time it seems to me that you were kind of mentioning other values as well can you say something more about other values that are close the environmental ones if you meant some other values as well that could...or otherwise...

R Sure I sort of mixed it up really but ehm well for me ehm part of, well this is all my personal opinion, ehm and it's...responsibility to the environment is part of the same ideology, if you like as responsibility to fellow people, to fellow animals and it's all wrapped up in the same idea that's why I was using it sort interchangeably almost and some people delineate responsibility to humans and responsibility to the rest of ehm existence...

GP ( ) talk of you combining together these...

R Yeah, yeah, that's it. And you can rationalize that by saying we all depend on the environment and the integrity of the environment is crucial to our survival or conflict or etc. but for me those are extra arguments rather than the fundamental argument which is that we have a responsibility to the world as well as having the right to survive and be comfortable.

Environmental citizenship, the sense of belonging to the national community was not directly mentioned as source of perceived responsibility. This might be due to the fact that the first question was asking the respondents about climate change, which is rightly considered as a global phenomenon, hence it is likely that this led the respondents to indicate as source of responsibility the sense of belonging to the global community.

Nevertheless, environmental citizenship was hinted at in some cases, but not clearly stated. For example, in the excerpt below, line 9, is the word "our" referring to the national community or to the world community as a whole?

A former Parish and District councillor is speaking:

Excerpt 6

GP You mean....you are talking about moral commitment of people then.

R Yes, yes

GP It is quite interesting because I was in the point to ask you to introduce a specific question regarding rights and duties in relation to the environment, and so probably you were starting to answer already to this question...what is your opinion about rights and duties in relation to the environment?

R Again I think we have certain duties to the community around us which means that we don't pollute, we don't destroy the environment around us because it doesn't exist just for us as individuals, it exists for all of our communities as a whole ehm I think it's difficult really to go beyond that because an awful lot of what individuals do can be important in very small ways but not in very big ways, whereas what some small group of individuals who have a lot of power, economic power, do can be very disruptive.

But Excerpt 6 could be seen as a statement underling the importance of the sense of belonging to the local community too (line 7).

The sense of belonging to the local community, a kind of perceived 'local citizenship', if so could be named, appears as an important theme to motivate actions against the wind farm (see Excerpt 7). In the next passage the respondent puts clearly in opposition the concerns expressed by the leader of the supporters' group and applicant of the wind farm, regarding the threat that climate change poses for the communities living in the third world, against his concerns for the local community. He uses expressions of emotional belonging like 'loving your neighbours' (line 6). His sense of belonging to the local community is hence considered as the main motivation for his opposition.

Excerpt 7

...he said to me, why don't you care about the children in Bangladesh that are going to be drowned, I said [...][25] look around you...

GP Why don't you care about?

R The children in Bangladesh that are going to be drowned as a result of climate change, that's the sort of thing that he will ehm use to make people feel bad ehm and I said to him, what about loving your neighbours the persons who live near you and the impact that you have on him and what you are doing, and that to me is what matters more, as you can

[25] […] is used to mean some words missing that could not be understood and hence transcribed.

see, I mean [...] I mean (it was acknowledged) that there will be I think I ( ) to that, there will be over two hundred people in this community who will be badly affected by the low frequency, medically badly affected, why should that be allowed to happen? Just because everybody say is better than climate change, so yeah I do have...I...I feel our community has been attacked by this and is not going to be healed by being offered shares in something it's...that's not even a sticking plaster.

This conflict between local and ecological citizenship is conceptualized by both the proposer of the wind farm developer and a member of the supporters' group in a way that is extremely clear. See Excerpt 8, lines 9-14 and Excerpt 9.

Excerpt 8

GP Yes, well, what is your opinion in local community involvement in protecting the environment? There are advocates of local community involvement that say that local community can provide a very good knowledge of the environment and so good environmental solutions while critics say that local communities could be involved but there would be the problem that they could be conditioned by their local interest so sometimes preventing good environmental solutions, what is your opinion about that?

R Well, I guess that in relation to wind farms that's quite complicated because the...the ( ) when you say look after the environment local environment than the local environment is, you know, visual, aural. The wind farm is looking after the (wider) environment is not looking after the (wider) in terms of renewable energy so, I think, there is clear potential for conflicts of interest between what may perceived as looking after the local environment and resisting industrialization or development within an environment and looking after the wider (in fact) environment and promoting renewable energy schemes, I can see there is a conflict of interest there. So as a local individual I can understand as people would want resist a development if they did not believe or understand the bigger implications of it because they could see it as actually damaging their local environment.

GP Mmh (.)

R Does this answer to your question?

GP Yes, yes, it makes sense, mmh (.), I think is quite controversial this matter of the local community involvement because in some cases the local community can make an environmental project alive contributing actively and fostering it and in other cases they

can prevent it by being realized because they feel that is a threat to their lives in some way...

R A threat to their lives (and goods) in some way (?)

GP Yes, to their environment in some way so...

R Well, definitely ( ) (0.12.50) are there...

GP It's quite controversial...

R Yeah, I mean nuclear power I mean I think you know another example is nuclear power stations, locally would be a threat to the local environment but nationally or globally in terms of CO_2 reduction of emissions it could be seen as a very positive development...

GP Yes that's true

R So I think it's a conflict between the local environment and the wider environment I think

Excerpt 9

R I guess as a citizen I suppose I see citizenship as I think you are using the word ( ) is within, you know, more of either as a local, locally defined citizen of your area or within a nation state and therefore I suppose once the relationship to (your) environment is (.) yes we have responsibility to our fellow citizens for a local environment (that's aside), here your question, but as a you know member of the global citizenship yes obviously you have wide responsibilities which are wider than just within my local environment.

The presence of a conflict of interests between local residents that support a wind farm in order to benefit the global environment and other residents that oppose to maintain the integrity of the local environment is highlighted by Warren et al. (2005, p.854): the authors name this as a "green on green debate". But while in their case the conflict is between environmentalists, in the case of Westmill it seems to go beyond that and encompassing the wish of benefiting either the local or the global community.

3.1.2 Local citizenship, place attachment and place identity

'Local citizenship' could be considered as a related concept of 'place attachment'. Although local citizenship has been defined in this document as the sense of belonging to the local community, and place attachment (PA) "…was defined as the affective relation

or the emotional bonds that people have with places where they live" (Bonaiuto et al., 2002, p.636), from the Excerpt 10 appears that the respondent, a member of the opposition group, shows an affective relation with the local environment that seems to link with the sense of belonging to the local community.

Excerpt 10,

GP Well, I understand, well as a farmer and you said before already you probably have instead clear what is important to do in order to defend the environment and the importance of living in a clean environment, so do you have any idea about what are the rights and duties of people in relation to the environment?

R Ehm (.) well our position on this farm has always been leave the land that we have been stewards of a little better than we took it on and that's my approach to life, whether it's towards people or whether it's towards the land, ehm so (.), obviously we need to nourish it and look after it ehm but we need to do that in an holistic way in a way that encompasses everything and that's I don't believe it's happening with this I think, this scarring on the landscape that is going to occur and the impact on the next generation, you see, the generation that grows up in Shrivenham now is going to grow up expecting that turbines on the landscape is an acceptable thing to do what's that taught them about looking after their environment, it hasn't done, it's told that is ok to do that and I think that is very poor education and I feel my position... I feel my position...

GP Because you think that they are going to spoil the environment

R Yes obviously they are going to, because they are going to add that huge visual impact where you can't help ( ) on to, I mean [...] has put a tiny turbine down over there, whatever what is doing with that I don't know, it's spinning all day and when you are out on the farm all you look at is that tiny, probably is only six feet across, but it draws your eye because it's moving, and do you see the trees around? Do you see the birds around? No, you see this spinning turbine, now you put these massive great things up, and that's what now this landscape is going to be, as it was put in the EIA[26], a 'wind farm landscape' whatever that means, we all know, because I've been to see these big ones and I know what it does, not only visually but the noise, it's the all thing, it's like saying, ehm "it doesn't matter what impact we have on this landscape" and it does matter for people's hearts and minds, it does matter, ehm and in their own attitude to their own landscape.

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In lines 10 to 15 of excerpt 10 the respondent makes clear that he thinks the turbines are going to change substantially the environment and the perception of it that the future generations will hold. Bonaiuto et al. (2002, p.636) state: “Place identity was defined as that part of people’s personal identity which is based on or built upon the physical and symbolic features of the places in which people live”. It seems that a changed physical environment therefore could alter the place identity (PI), the respondent speaks about “poor education” for future generations and the fact that they are going to perceive the turbines as a normal part of the landscape. This is not the case obviously of the respondent that depicts them in terms of “scarring on the landscape” (line 10). He makes clear that this ‘scarring’ is going to impact on the affective relation that locals have with their environment, their place attachment (lines 27 and 28).

However, are place attachment and place identity a source of a negative attitude towards the turbines or the consequence of the same independent variable generating such attitude? Bonaiuto et al. (2002) suggest that they might be a source of opposition; in the case of institution of two natural protected areas in Italy, this hypothesis appeared coherent with the results of the two surveys carried out, although they do not exclude a reverse pattern too, i.e. that an oppositional attitude was related with place attachment. In some ways the case of institution of natural protected areas could be similar to the case of wind turbines, particularly if potential economic negative impacts are considered.

Bonaiuto et al. (2002)affirm that the natural protected areas are perceived negatively by the local communities because they fear suffering an economic damage deriving from the change of land use, while probably those who will enjoy the biggest advantage are non-locals that could tour the areas or simply enjoy an overall reduction of pollution. Similarly, wind turbines benefit, in terms of reducing greenhouse gas emissions, the wider environment more than the local environment. In fact, local people will bear costs, such as the visual impact and some fear other impacts such as noise, devaluation of property prices and possibly more. Hence, it might be that ultimately, the perception of these costs could move some residents and particularly the ones that live closer to the turbines’ designed site to protest and then as a consequence they would develop a stronger PA. Further research could clarify if PA and PI are a consequence or a source of negative attitudes towards locally proposed wind turbines.

3.2 The co-operative scheme

On the basis of the work of Toke (2002) and Diekmann and Preisendörfer (2003), it was hypothesized that a locally owned co-operative scheme could favour a wider acceptance of a proposed wind farm, giving to local people both a sense of ownership and a financial incentive to support a local wind farm development.

It was assumed that the financial incentive could play a role providing a compensation for the local visual impact.

After reviewing the transcripts though these assumptions needed to be challenged.

First, the idea of having a community owned co-operative appeared to be more an ideal aspiration than reality, mainly because wind farms developments are often controversial and face a certain degree of opposition. This might not be the case always but certainly it was for Westmill wind farm. The result of the confrontation between supporters and opposers was the creation of two networks of local people both active in trying to persuade primarily the local authority charged with the planning permission process, The Vale of White Horse District Council, and further making efforts to move people in support of their actions.

The local debate was apparently hard as reported by witnesses and actors.

A former district councillor reports:

"I was involved with the wind farm at Watchfield particularly because on the day after my election, ten years ago, having celebrated my success the night before ehm I had a ring at my door bell at 8,30 in the morning from somebody who wanted to know what my attitude was to the wind farm. [laughs] I (ear) nothing about the wind farm at that point I having just been elected, I hadn't been briefed on any of the issues..."

While the head of a local parish council describe the division with these words:

"Well it has polarized the village and to the extent that other expressions made, half are for it and half are against it, now... 'well no I esteem half are against it, half are concerned'...."

A member of a third party organization backing the support group:

"GP Yes, and regarding Friends of the Earth, you were aware about this wind farm project in Watchfield?

R We were probably contacted initially by the farmer [...] probably coming across by now, he wanted basically our support because of all sort of very locally strong anti-contingency, he was then looking to get involved with environmental groups who see the broader global scale and aren't as interested in, you know, 'not in my back yard' sort of issues, so he contacted us which haven't got involved on that specifically...."

This division was acknowledged also by both the parts involved in the battle: the opposition and the support group.

A member of the support group talking about information:

"The reason why we had such a fight on our hands, I am sure you know it already is because people are frightened and a lot of misinformation was made...."

And a member of the opposition group shows his interpretation of the conflict:

"This community was a well balanced caring community with neighbours who look after each other and to (until) care of each other, what more is community than that? And this idea has just caused complete divisions...." and from the same interviewee:

"It's gone crazy, it's it's a type of dominance just remerging in a different form of people wishing to dominate other people under the guise of green, and that's terrible."

It is not possible to establish the support or opposition of local residents towards the wind farm. The survey commissioned by the applicant (Weston, 2002) didn't measure directly the support and just asked about the perception of the changes in the landscape and a slim majority of the total sample (51,5%) expressed the opinion that the landscape would have become more unpleasant or more offensive.

This conflict between the support group and the opposition group led to a situation that possibly prevented a high participation to the co-operative by the residents in the villages immediately close to the wind farm, (although no detailed data was available regarding this assumption). As a matter of fact the shares sale was extended to the entire national territory and the admission of large investors was allowed abandoning the limit of 80 shares per subject (in fact Midcounties Co-operative bought 75000 shares). In this respect a useful insight can be offered by the survey cited above (Weston, 2002)where 59,5% of the sample said that they would have not invested in the co-operative.

There is a reason in this specific case that certainly exacerbated this division, in fact the initiative of promoting a wind farm was not conceived initially as a community owned

co-operative but rather as the personal initiative of a single farmer and therefore the subsequent project of establishing a co-operative, possibly community owned, has been perceived by some members of the community and particularly by the opposers as a mere move in order to get the support of the community and hence to achieve an higher chance of success in the planning process.

This is how the personalization of the project has been perceived by a member of the supporters' group:

GP Why do you think that was not understood the sense of a co-operative?

R I mean we campaigned and said you know, is going to be the local community that will benefit but I don't think that people really understood that they could actually put their money in, even though we said you only need 250 £, you know, to invest. I just don't think people realized that it was actually could be theirs and I think that partly is ( ) from the fact that the original application went in twelve years ago and it was a fairly small wind farm and it was seen entirely as [...]'s baby and he was going to profit, so I think it took a long...I don't think we ever got over that idea that he was going to be the beneficiary, even though he consistently said "this is..." you know, "I want to do this because I want people to be involved".

The promoter of the co-op and landowner makes clear that this personalization has played a role and actually admits that for the first application he didn't consider the community owned co-operative scheme:

"GP probably there is matter of communication as well, off course you probably made all the efforts to try to give another kind of image of the project...

AT But if I said, even though, even from the beginning, for this planning application it was seen to be some community ownership and to be fair that wasn't there in the past, but for this one it was there, people have to believe what you say and didn't actually believe you. And why should they believe you? You know you haven't done that before, you have no experience you have no track record of having done that, so they wouldn't necessary believe you anyway so, if they are open to believe you they will....just because I've said that [...] doesn't mean that people, reasonably enough, have to accept it because things can change you know maybe I've got planning permission so I quite actually don't do it as community ownership....you know, you know... thank you very much. You know until that happens you don't know."

That actually the landowner had a leading role throughout the all process of promoting the wind farm appears evident from different sources.

A member of the supporters' group explains how he joined the group:

"....I became involved in that because I taught environmental science to my students and they needed to know about alternative energy as part of the course, so I got in touch with [...][27] because I knew that he was trying to get planning permission and he talked to the students and I got to know him a little bit through that and then bumped into him few more times and from that he invited me, when he realized that it was just taking so long to get the application through, and he knew that I was very keen on alternative energy, he suggested that I came and joined the group, so I did. Ehm it was very ad hoc group we just chatted, you know people came and went it wasn't a signed up membership or anything like that, and [...][28] asked me sometimes to do interviews for the press or to contact the press and just to be involved so I was there really more as a support and giving ideas as to how we could progress and put pressure on and writing letters to the councillors and writing letters to the press and so on. I say that there was a lot of that kind of activity that it was done very much with the group, you know, and different people helped at different times."

The active promotion of a network of supporters by the landowner of the wind farm also emerged from the transcripts supporting the idea that his figure has been always seen as the prominent one promoting the wind farm.

Here is a pertinent account of the head of a local environmentalist group that baked the wind farm:

"GP Yes, and regarding [...][29], you were aware about this wind farm project in Watchfield?

R We were probably contacted initially by the farmer [...][30] probably coming across by now, he wanted basically our support because of all sort of very locally strong anti contingency, he was then looking to get involved with environmental groups who see the

[27] The name of the landowner has been omitted.
[28] The name of the landowner has been omitted.
[29] The name of this organization is omitted.
[30] The name of the landowner has been omitted.

broader global scale and aren't as interested in, you know, 'not in my back yard' sort of issues, so he contacted us....."

In this context of personalization of the project the co-operative scheme incurred the risk to be perceived just as a move to attract public consensus.

In fact this argument was exploited by the opposition, as this quotation of a member of the opposition group shows:

"GP Well, do you think that the fact of selling the shares, in the local community is going to make any difference in terms of the opinion that people...

R I just think that's a clever ploy to try to cover up the divisions that occurred in the community, it's trying to buy people off and try to tell them that they are going to make something out of it and that they are going to feel better in themselves to doing it, and I think it's cynical, I do."

And again from the same interviewee:

GP They basically claim that it has got an educational value and a revenue for the local community, because of the shares...

R But that's just buying them off, isn't it? That's juts buying off the community to stop the community from actually saying "no we don't like them" no?

Interestingly enough, the fact that the co-operative scheme with its revenue could be perceived by the community as an attempt to buy their consent is expressed by a member not for profit organization that backed the wind farm project:

"....in terms of specifically ehm community benefits then that can have great impact in the planning stage particularly it can swing a community for or against it depending on whether they perceive it as bribes or they perceive it as fair contribution to the community to compensate for the visual disamenity."

The fact that the initiative was perceived as ultimately promoted by a single subject may have left someone with the suspect that the advantage of it was mainly for the founder of the co-operative. It might be worth to add that the subject initially promoting the wind farm is also politically active and hence somehow a public figure, possibly appreciated by some local residents and possibly despised by others.

An expression of this suspect of a personal advantage for the landowner is expressed in the word of a member of the opposition group:

"R Well to set up any kind of renewable energy scheme is going to cost money and presumably it would be unreasonable to expect anybody to do it without some kind of recompense for so doing. On one occasion at a meeting [...][31], the applicant here, was accused of only being interested in the money and his bland reply was "well we all need money!" [laughs] which is true but it does lead you to question slightly his real commitment to the environment."

3.2.1 Community owned or potentially divisive?

Till here, it has been highlighted the peculiarity of this case and how this might have affected the local debate. Still, it is possible to think that some degree of opposition would have been anyway present, even if not exacerbated by the perception of an ultimately personal project rather than a community one.

The opposition to a wind farm proposal, depending on its ability to involve locals, could create a divide in the community preventing a number more or less large of people to adhere to the project. Hence, the result could be a co-operative partially locally owned but not strictly community owned, as a fairly large amount of people would abstain from adhering.

This situation could also lead paradoxically to a stable internal divide within the community, being the wind turbine a constant memory of the conflict.

This point is expressed by the head of a local parish council:

"GP …if we could compare renewable energy development owned by the local community and renewable energy developments that are not owned by the local community, what do you think that would be the difference in terms of impact on the local community? Do you think that they could impact differently on the local community?

R I don't think so, I don't think so. I think the only difference, perhaps might be that if you have a background of the kind of 'acrimony' that we had here between the supporters and the opponents, I think if you have continuing local ownership amongst those people

[31] The name of the landowner has been omitted.

who were great supporters then it's just going to keep an open wound festering, and I think that's the downside to it...

GP Keep an open what?

R Keep an open wound festering, they would just stop the wound from healing because these people will be going to their meetings and we'll be having, you know the publications going out, details will be going out and people who were against the wind farm in first place, you know, just will not like that and there will be a constant reminder of a battle lost.

Another ex-councillor expresses his view about the potential of dividing the community:

"...once again (and) this polarization thing, local co-operative implies that everybody invest in it and we know that everybody won't, so once again you get a polarization of those that are in the club and those that are outside the club."

And finally also the promoter of the wind farm shows this concern:

"Are there any disadvantages? That's the... [...]Well I suppose as the potential to divide the community between people who think that's a good thing or a bad thing and therefore some people making money out of it and others choose not to invest in it, and then there's an element of, you know, potential some sort of division."

Other interviewees are more optimistic and confident that, once built the wind farm, local residents will accept it after realizing that the impact is not negative. This position though is solely expressed by a member of the supporters' group and by a representative of a supportive organization.

3.2.2 Compensation

We could say that compensation for the visual and other impacts constituted by the financial revenue is actually just available for the subjects that ultimately invest in the scheme. Although the co-operative could consider offering some free services to the local community (and at the moment of data collection was not certain), still it's likely that these will be a minor compensation in comparison with the financial reward following the investment that will accrue for the co-operative members.

It's interesting to notice that the survey carried out by Oxford Brookes University (Weston, 2002) shows clearly that a vast majority of local residents (75%) think that the

co-operative should provide some sort of community benefit, even though nearly 60% of the sample said that they won't invest in it.

The limits of the sorts of compensation entailed in the co-operative scheme are recognized and highlighted by the co-operative promoter and landowner of wind farm site:

"Yeah, well I think that if we own something we are obviously more well disposed, you know, benign disposed towards it [...]so if you own something there is the balance between the financial benefit that you get from that and the inconvenience whatever that maybe. The situation with community owned projects is that only a certain proportion of the community will subscribe into that, so it doesn't really address that it goes someway towards it. I guess the other way to addressing that is for the project to commit a proportion of its funds as income towards what would be seen as local organization representing the community being that the parish council or the school or the scouts or whatever may be that's the other way or (prompt cheap) electricity which is very complicated but....it would be good if it does that and certainly that is what this projects is hoping to do both through local ownership and then providing a source of income to the local community bit it's (.) yeah, yeah, but I don't think community ownership it's (squarely) on the head because some people won't have any ownership of it and they will be looking on hear or thinking the hearing or whatever might be or have a distress of having a development near them, if they feel distressed by that. And for people who feel genuinely distressed they (don't want) own it anyway so it's for the people who are most (affected) that's actually a poor compensation..."

The fact that economic revenue might be a compensation is strongly dismissed also by the chair of a local parish council:

"GP Well advocates of this community owned co-operative scheme say that, for example for wind turbines, the revenue coming back from the scheme to the local community could compensate visual impact and noise, what do you think about that?

R You can 'never compensate' visual impact 'there's nothing you can do to compensate for that' (.) an as for the other issues, I think they are largely more about fear than actuality, but is once again, it's how you get people that are worried to a stage where they (see) to be worried, and therefore I don't think it's about the money side of it if you like..."

The possibility that the attractiveness of the project and of the investment was lower in that area, considered affluent rather than in a low income area, was suggested by a local councillor:

"...I think it makes sense in certain contexts like the sort of examples that we were talking about earlier, you know, Scotland and so on, but I think, in area like this which is a relatively affluent middle class area where people have got expensive houses, there is really nothing that you can offer them in terms of economic benefits, so to that extent what they would see is these benefits, but in other places I think where, you know, there is a lot of local unemployment where you have got the older industry like mining and steal ( ) have you, which have died and people are unemployed, I think there's got to be a part of the selling point there for them but it's very much a situational thing."

Although the point made by this councillor is understandable, in the specific case of a community owned co-operative the opposite could be true, in fact as SES models of participation suggest (Verba et al., 1995), it is affluent people that are more likely to participate and, in this specific case, more affluent people could more easily afford to buy shares of the co-operative. Regarding this, it is worth to notice that in the Oxford Brookes University survey (Weston, 2002), earlier recalled, one respondent answered an open question stating the fact that she couldn't afford to buy the shares.

Maybe the overall support could be higher in an economically depressed area if it was thought that the co-operative is going to generate jobs, but paradoxically this higher support would be less likely to express through the behaviour of buying shares.

The fact that locals may appreciate wind turbines depending on the characteristics of their location and that may be interested in exploiting the economic opportunities created by the wind farm is suggested by a member of a public organization committed in promoting renewable energy that backed the Westmill Co-op project:

"....I am sure that you have heard about the two turbines there, those ecotricity turbines first one was part of the environment centre (ecotech is) into that ehm this is a place in Norfolk, they put the first one with a viewing platform, and it's a particularly nice part of the country I should say I am from that area and but we have a landscape that suited to tall object because it's very flat like Holland and so people are open to it but they supported the turbine the even the opponents reported that once that was up they could go up and view from out the top of the turbine and it's becoming a massive tourist attraction for the town and the local community demanded a second one in the company's

consultation and so now they have built a bigger one there also in the town and so that's an example of what can be done and what a sense of ownership can do even without the economic ownership."

It has been highlighted so far the specific context of the case study, how this has influenced the local debate and the limits of the co-operative scheme in overcoming opposition. Nevertheless, it was said by some respondents that the community owned co-operative scheme was also considerable to be a potentially good scheme in comparison with purely commercial schemes, in the case that the wind farm was placed far away from the village in a rural area. A member of the opposition group makes that clear:

"...in theory I could envisage a community such as ours which had the opportunity to support a wind farm that was on a hill top two miles away on wild ( ) which would not have serious impact upon the community I hope such people would leap at the chance of supporting it and of doing something, a little step if you like to renewable energy sources."

It is necessary to mention that this subject had a strong pro-environmental attitude that showed along the entire interview based on an accurate knowledge of the current debate about climate change and energy sources.

The co-operative scheme seems to have better chances of gaining a larger local support than a privately owned external company because the profits would stay within the community. On this aspect a local councillor that opposed the wind farm comments:

".....in theory if the community generated the project then they'd be more likely to support it, if a big company corporation did it then probably it wouldn't get a lot of support, because it would be seen as being a purely profit making thing, you know...."

The member of a partner co-operative using a similar scheme of Westmill, partially locally owned, tell us about the ability of the scheme to influence undecided local residents:

"GP How do you think that local ownership of wind farms influences levels of opposition or support for wind farms?

R Yes gives voice for supporters & help sways undecided but not going to affect strong antis who are a minority 5% of population and vocal"

Also the original promoter of the wind farm thinks that the scheme is potentially able to attract more support than a private company although he thinks that, in this specific case, this didn't happen, mainly because of the lack of ability to communicate to people effectively the potential benefit for the community. Another detrimental factor that he underlines is the fact that people couldn't have any knowledge of similar successful schemes, because they are new in this country and awareness could play a major role in the future to facilitate the acceptance of a community owned co-op wind farm:

GP Ok, about levels of opposition and support of the wind farm in particular this one but in general all the wind farms, do you think that the local ownership can make a difference?

R I don't think it has, I think it should do, I'm surprised that hasn't, I suppose it is because people don't understand what it is really. It's to (engage) in a concept for most people don't quite get their heads around. So it hasn't made very much difference but it can do if the issue is clearly explained what the benefits are and I think if there are more examples (that were) happening, yes it will make more difference in the future.

He continues building his argument mentioning the fact that the lack of established and successful community owned co-operative schemes makes people more suspicious of the proposal and less easy to adhere:

"R....if they were you know, relatively neutral, would they have been less neutral if there (is) a (co-op) ownership? It may make a difference (.) yeah I think in the future will make more difference than it is at the moment when there are more examples of projects like this I think. And then other communities can say why can't we have some of the (action) to because they (they've got it there). There are almost no examples of that and they aren't publicized so when a wind farm planning application is the ( ) the opposition (say) 'let's stop it!' ...not let's have some ownership of it."

The fact that the co-operative community owned scheme was unknown in the United Kingdom was pointed out also by a member of the opposition group when asked about other factors than the economic incentive that could lead people to adhere to the co-operative.

GP Do you think that there are other factors that influence people in buying a share apart from economic revenue?

R I don't think that I am in a position to offer an opinion on this, there is no comparable situation anywhere else In Britain, whether there is in continental Europe, you will probably know better than I do.

GP There is a case in Britain as well the Baywind co-operative in Cumbria.

R That's right, yes but this is not a purely local ownership, the term local is a relative one, they are gathering funds from people originally in the north of England, in Lancashire particularly.

3.3 Local opposition and support to wind farms framed within a rational choice and attitudes integrated approach

Diekmann and Preisendörfer (2003, p.433)outlined the low-cost hypothesis:

"The basic idea of the low-cost hypothesis is that environmental concern influences ecological behaviour primarily in situations and under conditions connected with low-costs and little inconvenience for individual actors. The lower the pressure of costs in a situation, the easier it is for actors to transform their attitudes into corresponding behaviour. If costs are high, environmental concern does not help overcome one's reservations, and there will be few or no effects of environmental attitudes." And:

"The cost variable is continuous and is understood in a broader sense, i.e. not confined to financial costs. In addition to additive effect of costs and environmental attitudes, the hypothesis postulates an interacting effect in the sense that the strength of attitude effects on behaviour varies depending on the cost intensity of the situation."

The low-cost hypothesis could possibly be more exhaustively articulated considering also benefits and hence a low-cost situation could be considered as such when the benefits compensation is not able to reduce the perception of costs. Actually, a situation could be even cost free or convenient for example installing roof insulation using a grant to cover the economic cost.

The low-cost hypothesis considers pro-environmental attitudes as activated when the difference between the cost of a pro-environmental behaviour and the cost of a non-pro-environmental behaviour is small. For instance buying an organic product that is just a bit more expensive than an equivalent non-organic.

Following the low-cost hypothesis, avoiding the "disutility of cognitive dissonance" (Diekmann and Preisendorfer, 2003), possibly caused by holding a personal pro-environmental norm and behaving against such norm, would compensate the difference of cost between a pro-environmental behaviour and a non pro-environmental behaviour. Hence an individual would be willing to bear the cost difference because would be actually a minor cost than the disutility produced by the cognitive dissonance.

Diekmann and Preisendörfer (2003) therefore suggest indirectly that individuals would produce a subjective evaluation of costs and benefits.

Such evaluation could be conceptualized as entailing the assessment of subjectively perceived major or minor costs and benefits that may deriving from situational factors and attitudes. Major costs and benefits influence primarily the chosen behaviour while the attitudinal costs/benefits would come into action only when the balance of benefits and costs is either neutral or a 'low-cost situation'.

What are major benefits and costs? Certainly they are not only financial, in fact we could also consider time costs/benefits or health costs/benefits as part of this category. For example cycling to work might be cheaper than using a car but, even leaving aside the matter of comfort, if the journey would take one hour versus 15 minutes by car then the importance of time might be determinant in shaping a choice.

Finally, it is relevant to notice that the perception of the value of costs and benefits is subjective and, when they are financial, their perception is reasonably assumed to be related with the economic status (ES) of the subjects. This is evident with regards to luxury products, for average income people the economic sacrifice that purchasing them would cause could not be compensated by the benefit of using these goods, while for affluent people the cost is not so high in relation to their income or possessions and consequently the benefit of their use would be perceived as overriding the cost.

The choice of a rational choice and attitudes integrated framework leads to the need of proposing a model of explanation of support-opposition of wind farms that entails that the subjects living in the local area behave in accordance with the average economic status of the area considered. This local mean ES will probably explain different attitudes towards different behaviours. This model of individual attitudes-making process leading to support or vice versa opposition, could be represented as follows in figure 5.

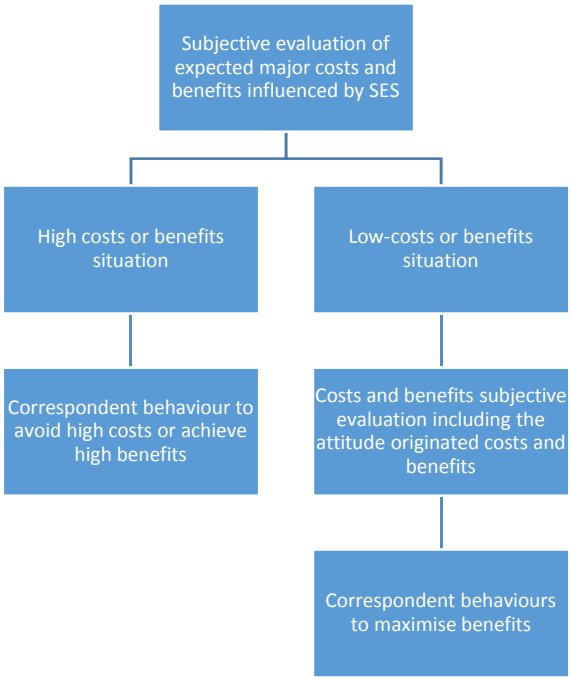

Figure 5 Indvidual process of formation of support/opposition towards a locally proposed wind farm based on a rational-choice and attitudes integrated framework

3.3.1 Is the case of wind farms as a high-cost situation?

The theoretical framework just outlined, combining rational choice and attitudes, could contribute to explain behaviours of support and opposition towards wind farm developments.

In trying to do so is necessary to speculate about the possibility to define support to wind turbines by local residents as a high or low-cost situation.

Probably the only reasonable answer is that for a large number of people is a high cost situation, particularly before the construction of the wind turbines, when they can just guess the impact that the turbines will have on their lives and hence incur the risk of overestimate some costs.

Concerns for noise, devaluation of property prices and visual impact maybe the core factors influencing a negative attitude towards the proposed local wind development. Negative perceptions of noise and visual impact are brought to the extreme to be considered by opposers as real threats for the wellbeing of local communities.

Noise and particularly low frequency noise, was reported as a concern by anti-activists in this study, and in general noise is often mentioned as one of the main concerns for local residents (Warren et al., 2005).

The visual impact is considered as a serious impact by some to the point of anticipating of feeling distressed by a landscape that would consider unpleasant, as some respondents suggest.

Certainly there was great concern between the local community around the Westmill site as suggested by the survey commissioned by the proposer (Weston, 2002, p.11-12 ans p.33-35): in this, several respondents expected that the local landscape would have changed after construction to become more unpleasant (32,5%) or more offensive (19%) with regards to the physical features and more unsettling (31%) and more threatening (9%) regarding to the sense of wellbeing that the landscape provided..

In terms of economic costs, devaluation of property prices could have been a motive to act against the wind farm and some interviewee made it clear in their answers. The real possibility of a devaluation of property prices is not of our interest here, this might be in fact a non-existent problem as some research states (Sterzinger et al., 2003), the perception of this risk is what matters for local residents, in a pre-construction phase at least. Another economic cost that doesn't apply in the specific case of study, but certainly does elsewhere, is the perception of an adverse consequence on the local tourism industry. This was not the case of the Vale of the White Horse mainly because locally the tourism industry seems not to be much developed.

It might well be that visual impact and noise were considered by some subjects as health costs, especially noise but also visual impact when considered as affecting the emotional well-being.

On the other hand, what are the possible benefits that could appeal to the local community and that could counterbalance the costs just mentioned on their same level of importance? Probably the economic revenue that could be used to offer free services to local residents, or a distribution of a proportion of this within the local community. Another hypothetical indirect economic benefit for the community could be providing local jobs (Warren et al., 2005, Halliday, 1993). This could appear as an appealing benefit in economically deprived areas but does present little or no appeal in affluent areas where the unemployment rate is very low.

The co-operative scheme was hence trying to offer an economic benefit for whoever was willing to invest in the local wind farm, which, in theory, might have appealed the community. The economic opportunity offered by the co-operative scheme, though, was not perceived by the interviewees as very strong, but interviews were conducted before

the diffusion of the investment's prospect and thus perceptions might have changed over time. Certainly during the local debate the perception was that such economic benefit was comparable, if not less attractive than others offered by the then current market of investments and, further, some respondents questioned the financial viability of the wind. Nobody during the interviews expressed the hope that the local wind farm could create jobs or provide some free service for the community. Some respondents made clear that the local community was quite affluent, hence its members would have not found the economic benefits so attractive.

In the following table (table 3) major costs and benefits that emerged from the interviews realized are listed.

Major costs	*Major benefits*
Health costs:	Economic:
Noise pollution, distress caused by the visual impact.	Attractive investment, free services provided to the local community.
Economic:	
Devaluation of property prices.	

Table 3 - Major costs and benefits identified in the case of Westmill wind farm co-operative

The perception of the costs so far considered is of course subjective but still appears to be related with the physical proximity, as already discussed in chapter one, section 1.5.4. The Oxford Brookes University survey of local residents living around the Westmill site in fact shows that there is a greater concern for the visual and noise impacts of the turbines in comparison with residents living farther away.

As already discussed earlier in section 1.5.4, the 'inverse NIMBY' syndrome (Warren et al., 2005), holds the hypothesis of a change of attitudes before and after construction, indicating specifically that residents living closer to a wind farm site would be those who oppose more the development before its construction, but eventually the same individuals would become the most supportive once that the wind farm is built and operational.

How is it possible to explain this change? The explanation that appears to be the most reasonable is that opposition and support are expressed as result of an evaluation of major costs and benefits first, as outlined in the diagram presented in figure 5. The perception of those costs though is based on expectations, because most of the respondents are very

likely not familiar with wind turbines, if not indirectly, trough media coverage that often concentrates on controversies and hence might return an image of wind farms that bear relevant costs for the local communities hosting them. These expectations may be over-pessimistic as a result of the anxiety that respondents confronted with the perceived risk of getting some negative consequences might experience.

After the construction, though the perception of costs and benefits is reassessed and as result, opposition decreases or even support develops. Likely then many more subjects consider the situation as low-cost or even as beneficial and hence, under the influence of positive attitudes towards renewable energy, which have become salient, end up being supportive. The same shift is less likely to happen for those living away from the development, in fact they are less likely to reassess the impact of the turbines on their lives, as they are not part of their immediate surrounding, as consequence they may hold some old prejudice related with possible negative impacts such as noise, devaluation of property price or visual impact. They could in fact erroneously assume that these negative impacts are valid in the area closer to the wind development although not living there these assumptions are less likely to be challenged.

A second and complementary hypothesis to explain the reassessment of costs made by local people may be proposed according with the 'Stress theory' of Rippetoe and Rogers (1987, in Gardner and Stern, 2002): within the emotion-focused coping strategies to respond to a stressor, the authors identify: "...*avoidance* (actually, "denial", i.e., an attempt to repudiate or refuse to admit the existence or the size of the threat)...". Therefore it could be hypothesized then that some subjects, after construction, would 'force' themselves to consider the turbines as not disturbing, in order to avoid any unpleasant feeling or stress that the opposite view would provoke to them.

The two hypotheses outlined are not mutually exclusive: in fact a subject, for example, could perceive the turbines as much less noisy than expected and "deny" any annoyance as result of that noise level.

Whether it is not possible to present evidence of the 'inverse nimby' syndrome for the case of Westmill with regards to the post construction phase, it is worthwhile to recall here that the two leading figures of the opposition group, interviewed before the construction, lived arguably in the closest properties to the proposed wind farm site, hence supporting the earlier recalled finding of the Oxford Brookes University survey that

indicated a greater concern with the impacts of the wind farm expressed by residents living closer to the proposed site.

3.4 Major costs and benefits in the Westmill case

3.4.1 Noise pollution, a major health cost?

Noise can be one of the greatest concerns for local residents and actually has very likely been in this case of study. This was indirectly expressed in the local survey of Oxford Brookes University (Weston, 2002, p.37) where 64% of respondents said that larger turbines proposed in the last application will be noisier (38%) or significantly noisier (26%) than the smaller turbines that were originally approved. This means that local residents were considering noise as very well perceptible if they thought that they could appreciate the difference between smaller and larger turbines.

The opposers often mentioned noise as one of their major concerns. Particularly 'low frequency noise' was reported as the greatest concern, as it was assumed to affect negatively the health of the local community.

One the members of the opposition group shows great concern and having actively sought for information regarding this topic:

"....recently research by a Dutch man, a Dutch professor of Physics who is very highly regarded across the world in his knowledge of low frequency vibration, he finds that vibration which you cannot hear but which do impact on our bodies, we are talking about vibrations of less than once per second, one of the sources of this vibrations is the pressure created when the blade of the wind turbine comes past the column, it sends a little shiver through the column and that vibration passes through the ground for up to ten Kilometres, now there has been much research in America particularly, but elsewhere also into the effect of low frequency vibration on human body, NASA for example are very concerned about low frequency vibration impacting on helicopter cruise causing disorientation, loss of concentration, dizziness, headaches and actual blackouts to which some people are very much more susceptible than others, some people are virtually immune, it is accepted, but not everyone, now the health of a big community could be at stake, I would see as absolutely proper that that community and its representatives do ask a lot of serious questions as to how much really know about such phenomena, and what it is the likelihood of a serious damage."

These worries were shared by another activist of the opposition group that evoked strong images of serious harm to humane health giving a dramatic personal account of meeting some subjects affected by low frequency noise living close to a wind farm and by reporting about the use of low frequency noise as a weapon of war:

"...I talked to one woman and I went to see her in her home and it was...her husband said to me, he said to me "I don't need to know which way the wind is blowing in the mornings, I simply have to look at Gwen to see how ill or well she is and then I know" that from their pos...and it was a south west wind that blow up to the low frequency ehm into their home and they had to move and you know...

GP They had problems caused by the low frequency?

R Yeah, yeah...

GP So was not just the visual aspect...

R No no it's the low frequency which is something we have all campaigned against because there are people in Shrivenham that are part of the army who have been trained about this in terms of weapons of war, using low frequency as weapon of warfare and the research shows that the trouble was that they couldn't ( ) affecting their own soldiers, that its impact was devastating, and so we knew that there was a problem potentially. It's only now, unfortunately for us, that there is now a report, actually commissioned by the DTI to show that there is no problem, that actually has proved there is up to ten kilometres, a very real problem of low frequency ehm that affects people and ehm you know it will become a public health issue and we should still be going back to our planning office and saying, "are you going to take this down? These are breaking the rules" we are not going to stop because we are not going to stop speaking about the fact that these things are harming us, if they don't great, let's hope they don't."

This alarmism is not confined exclusively to the opposition group, showing hence the fact that other subjects that opposed the project, even though not activists, used this argument to oppose the wind farm. A local councillor that was also member of the planning committee so expressed his concerns about low frequency noise:

"....my main opposition to the wind farm, was based on two medical evidence, which I saw, ehm which suggested that people leaving near the wind farm within five hundred metres or so would be affected by low frequency sound. This is one of the major things that (I've doubted), you know, I was a bit uneasy about and these were papers which were

written by doctors in the medical journals ehm and these particular doctors live near to people who live near to a wind farm, do you understand? And they described various phenomena, one was Dr Amanda Barry which was actually going to come here ehm to speak against the farm, you know at the planning meeting, but she...at the last moment, she couldn't come, you know, and I think that her evidence might have persuaded the planning committee a bit more, ehm, the main problem that she saw was that some people, not everybody but eeh...felt that particularly at night, they had a sort of a resonance effect, you know it's it's like...they couldn't hear it, you can't hear low frequency sound, you know, below ten hertz it's impossible to hear, ehm but they felt that there was something, sort of uneasy about themselves, you know, they were unable to sleep, they had what we call anxiety syndrome states, you know, and this might have been psychosomatic, you know, in their minds really, but we weren't convinced about the evidence, mainly because the patients many of them described that when they went on holiday of even when they stayed with their relatives, there were no problems, you know, now again it wasn't (fastly) determined whether this was psychological or not, ehm but then we had a professor here, Professor ( ) who works at the military college of science, he is a military man and he confirmed that in his opinion low frequency sounds could damage people and we then opposed it mainly on the basis that there was not enough work done, you know, there's plenty of work done on audible sound, in other words what you can hear, but not enough work done on low frequency sound and this was the only real matter that we...I mean the visual effect was no problem, you know the ehm eeh...the fact that ok it was being built on a green field site which in this area would not normally be permitted, you know, if this was a turbine station, you know what I mean or a power station or anything like that we would not admit it, permit it, but because was a green source of energy eehh...it was considered to be ok for a green field site, you know, but the low frequency sound was the main issue and you know, this I believe is why the Danes and the Germans now tend not to build their wind farms close to a population area, because we read some papers from a Danish work and partic...and German work as well where the Danes were building a much more off shore you know, out to sea, (laughs) and the Germans have stopped actually building wind farms near to a population areas, not only because of low frequency sound but for other reasons, you know, so this was the reason why we felt you know, our group, there was a small group of us on the planning committee who did not...who were not very comfortable, you know."

These fears for low frequency noise were presented also by another councillor, who expressed his opposition, although in this case he reported how regrettably was impossible for himself and the local community to obtain independent information about low frequency noise and other issues related with the wind farm:

"...and this is what has been difficult for us as a Parish Council, it has been very very difficult to get information, on the risks of the things, you know, I've low ehm the noise the low...low velocity noise, it has been very very difficult to get expert opinions because the people supporting the wind farm went on and got (wonder) of expert opinions, the ones that were worried about the wind farms went out and got another lot of expert opinions and 'they were miles apart'..."

Noise and low frequency noise were presented as one of the main reasons for opposition by nearly all the subjects interviewed that expressed opposition and that were living in the area. One exception being an organization that expressed opposition on other grounds and specifically because of their statutory interest is in the conservation of historical buildings; while another exception was an ex councillor that opposed the project because of its visual impact: he mentioned anyway the fact that the campaign against the wind farm used the noise issue even with extreme arguments that he considered absurd. Finally, it is worth to mention that also a member of the supporters' group stressed how opposition gained ground within the community alimenting fears about noise and loss of property values.

In conclusion, it's possible to say that the noise issue had an important role and that, through the specific matter of low frequency noise, was considered as a potential public health threat.

3.4.2 Distress originated by the visual impact: as a possible health cost

Usually the visual impact is thought to be a primary motive of opposition because many local residents value the features of their local landscape. Nevertheless, from the answers that were collected it appeared that some subjects were even suggesting that the visual impact was a source of real distress for local people. This effect of the visual impact, if possible, might be marginal and exceptional but some subjects that feel to be highly disturbed by the vision of the turbines hypothetically could develop a sort of distress induced by a frequent exposition to a landscape that comprises a wind farm. The possibility of considering wind turbines as an environmental stressor is consistent with

the definition of this given in the literature about 'Stress Theory': "The theory defines an environmental stressor quite broadly- as an element of a person's environment that is unpleasant and/or that threatens the person's wellbeing in some way" (Bell et al. 1990 in Gardner and Stern, 2002). The stressor is considered to affect through two cognitive appraisals: a primary that recognize the stressor as such and a second that establish the subject's possibility of having a control on this; if such control is impossible, the perception of the stressor becomes a source of stress and the subject will develop as consequence some coping strategies, such as, for example, focusing on pleasant features of the surrounding environment (Gardner and Stern, 2002).

In the following excerpt a local councillor that opposed the wind farm shows to acknowledge the link between visual impact and distress:

"...I mean if I had ehm, if I bought shares in a wind farm I think I'd (put up) with (laughs) with the visual impact, you know, everything that is causing distress to others (laughs) as long as it didn't affect me."

A member of VECS (Vale environmental concerns, the opposition group) instead expresses his concerns avoiding to use the word distress, but his argument seems to mean this:

"...its impact on what have been designated as an area of high landscape value cannot be beneficial and in the minds of many people could be seriously damaging, unfortunately personal reactions to a wind farm cannot be measured in terms of numbers, it is a subjective thing and I'm aware that some people like wind turbines, comparing them with modern sculpture..."

Also the landowner of wind site mentions distress in relation with the wind farm although he doesn't mention the visual impact as source of the distress, nevertheless he differentiate this distress from the noise annoyance:

"...some people won't have any ownership of it and they will be looking on hear or thinking the hearing or whatever may be or have a distress of having a development near them, if they feel distressed by that. And for people who feel genuinely distressed they (don't want) own it anyway so it's for the people who are most (affected) that's actually a poor compensation..."

It is worth to mention that in the Oxford Brookes University survey (Weston, 2002) 32,5% and 19% of the sample held the view that the landscape wold have become 'more

unpleasant' and 'more offensive'. While, answering another question 31% thought that the landscape would have become 'more unsettling' and 9% 'more threatening'). These results suggest the possibility that some subjects might develop a sort of distress because of the presence of the wind farm in the landscape.

3.4.3 Economic cost: the possible devaluation of property prices

The only economic cost that appeared to apply in this context was the devaluation of property prices. In fact although the Vale of the White Horse is considered by many interviewees a place of particular amenity, nobody mentioned a local tourism industry that could have been affected negatively by the wind farm.

The devaluation of property prices instead was mentioned by three interviewees.

One of them was a member of the opposition group, another was a member of the supporters' group and finally one was an ex councillor. It is interesting to note hence that, although not mentioned by other interviewees, it seemed anyway to be recognized as a concern independently of the role played in the local conflict surrounding the wind farm by the subject that mentioned this concern.

The quotations will make clear the relevance that this argument had for the opposition, till the point that it was suggested to be the only real concern of the opposition group by the earlier mentioned former councillor.

He said:

"...a lot of local opposition was orchestrated by local landowners ehm I think between the time Adam put his first application in and the second and third applications, there was a very considerable change in the local environment, because one of things that we end find happening was that Swindon, which obviously is a major town just few miles down the road from us, had decided that one of the things that wanted to do was to expand eastwards, in our direction and off course, I think particularly landowners who had thought that all they had was farm land now potentially saw a few years down the road, the possibility that they might have very very valuable pieces of real estate in their ownership and the sort of money that we are talking about is...if you have agricultural land, at present around this area, it will probably bring in about 5000 pounds an acre, (were) you to sell it, if the same land were to be sold as potentially development land either for housing development or industrial development, it is probably worth an excess nine hundred thousand pounds it maybe even being worth one million pounds and acre.

So when you start looking at difference between five thousands and you know, a million pounds an acre, you are talking (mega box), and I think that people who previously felt that the wind farm perhaps didn't affect them too much, suddenly saw that goodness it was real problem and started to be an orchestrated campaign against the wind farm by the VECS people in particular..."

And again:

"...GP Yes, have you ever thought about any possible link between opposition and support of a wind farm and local ownership?

R No I don't think local ownership in any way whatsoever affected the views that were taken here, I think there were economic issues coming from the opponents, because they felt that the value of their land and the value of their properties and so and so forth was going to be affected because they were turning out at the most outrageous horror stories, there was one guy talking from VECS one time, I heard saying if you had a home within a mile of the wind farm then you wouldn't be able to sit out in your garden on a sunny summer's day without having ear protectors, or you would damage your earning, you know, that's absolutely lunacy, but these were the sort of things that were being said..."

This position, motivating opposition mostly with the issue of loss of property value, didn't find any correspondence in any other interview.

Nevertheless, as said earlier, the concern for loss of property value was admitted to be a diffused concern also by a member of the supporters group:

"Yeah, the reason why we had such a fight on our hands, I am sure you know this already, is because people are frightened and a lot of misinformation was made, and is very very easy to misinform ehm, and so people feared that it was going to be very loud, people...some people genuinely don't like them, you know visibly you can't change people's mind on that, but lots of (who how) was made about noise, which was just completely inaccurate and a lot of fear of loss of property value that's...is there, I think it's in people's mind ehm and I just think, and I think a lot of...some elements of media have been very anti wind farm and therefore being anti this all process, and I think those things have made very much more difficult..."

3.4.4 Economic benefits: the revenue available for co-operative members and free services for the local community

Something has been already said in the previous section about the suitability of the co-operative scheme to overcome opposition and offer a compensation for the costs of the wind farm. Many expressed a negative opinion, but this regarded compensation towards people strongly against the wind farm. These subjects certainly see the possibility of joining the co-operative as "*not even a sticking plaster*" as one of the members of VECS said. Basically, their perception of the major costs is such that no benefit can compensate.

In the survey carried out by Oxford Brookes University (Weston, 2002) the majority said that they were not going to invest in the co-operative scheme, (about 60%), this might suggest that the local perception of costs was overcoming the attractiveness of the community ownership scheme and as a consequence the subjects assuming an anti-wind farm position didn't want to participate in the share sales to avoid to provide any support for the local wind farm. Especially taking in account the fact that the area is wealthy and hence a small investment would have not been a big sacrifice for most of the households.

For other subjects tough, provided that they may not perceive the major costs as real, or may be just slightly concerned about them, the possibility of buying shares and participating obtaining a revenue may be considered as a kind of benefit able to compensate or overcome the costs.

This was admitted by the opposers too, as one of the excerpts earlier cited shows, where a local councillor admits that some people may feel attracted as long as they do not perceive the visual impact as affecting them.

A member of the VECS, the opposition group, says plainly that this economic benefit might work on the majority of the local community:

"In theory I am sure that it is a very good idea if you can involve the local community by allowing them to buy shares and to profit financially from the operation of the community, sorry of the wind farm, I think the all community or ( ) a majority of it may be supportive and they will be prepared to accept the visual and possibly the audial impact upon them."

The shares were on sale at the price of 250 £ per unit, making them affordable for the vast majority of residents, especially in consideration of the fact that the local area comprised in the case of study is wealthy as shown by the census 2001. Considering the statistical unit of Shrivenham, (comprising the homonymous village and the villages of Watchfield, Longcot, Bourton), the rate of unemployment is less than half the English one (1,48%

versus 3,35%) while the level of education is higher with 37,6% of the population having a level 4/5 (degree or an higher degree) versus the 19,90% of English population (ONS, 2001).

About the safety of the investment voices were much contradictory, with supporters claiming that it was a safe investment and opposers that were suggesting the likelihood that was going to be a financial disaster and claiming that the supporters and the council cheated on the financial viability of the project.

Apart from enjoying the revenue, which was subject to buying shares, there were other possible economic benefits such as free services provided by the co-operative to the local community. This possibility was mentioned briefly by the landowner and first promoter of the wind farm. The survey carried out by Oxford Brookes University (Weston, 2002) shows that there is a large support of this possibility from the sample: 74% of the respondents said that these benefits should be provided by the co-operative. Being these benefits, other than the revenue reserved to the shareholders, available for all the community, these may be actually the only compensation for the people that opposing the wind farm would decide to avoid to buy shares, as suggested by the first promoter of the wind farm (see earlier quotation in section 3.2.2). Although respondents appeared clearly keen on receiving those benefits, the uncertainties related with what these were and when and in which extent they would be delivered, made them a rather weak argument in the debate around the Westmill wind farm co-operative and likely not much effective in attracting consensus.

It’s difficult to say about the perception of the public regarding the open ownership and community benefits provided by the co-operative scheme in fact, even though it appears a positive thing, someone might have perceived it as a way to bribe the community, i.e. to buy their consent: this was mentioned by an activist against the wind farm and by a member of a third party organization that supported the project (as already showed in section 3.2).

3.5 Socioeconomic status

SES socio-economic status (education, income and occupation) is regarded as a proven factor influencing positively political participation (Verba et al., 1995). Participation in co-operatives of wind farms is different though. The cost of participating in politics as an activist is mainly time, while in the case of the co-op there is an evident financial cost.

Further, the physical presence of the wind farm will bring some costs to the local community, as earlier discussed, while a political process does not generate costs *per se*. Nobody in fact, in a democratic environment, feels threatened by elections or public party meetings. Hence, the influence of SES might be very different in relation to wind farm co-ops. On one hand it will make easier for people to buy shares, because income, education and likely a certain professional status might well lead people to be more prone to invest in a local wind farm, or at least would prevent them by giving up because of lack of resources, both financial and in terms of ability of understating what actually means to buy a share and investing a co-operative scheme. On the other hand, local people, if affluent, may feel that they are not interested at all in the local economic benefits that the wind farm might bring, in fact they don't need them. This can be true for local jobs or for local free services and surely for the revenue of the co-op: in fact they could use their money for other investments, maybe even more profitable, in fact even though entailing more financial risk, being they affluent, this would not impact significantly their wealth as long as they differentiate their investments.

A former local councillor expressed his opinion about the importance of SES in the case of Westmill:

GP "…a specific hypothesis that some people do is that local ownership with the revenue that could produce for local people could compensate them of the negative perception of the visual impact or the negative perception of the noise of the turbines. Do you think that makes sense or you are sceptical, what is your view?

R yeah, I think it makes sense in certain contexts like the sort of examples that we were talking about earlier by you know, Scotland and so on, but I think, in area like this which is a relatively affluent middle class area where people have got expensive houses, there is really nothing that you can offer them in terms of economic benefits, so to that extent what they would see is these benefits, but in other places I think where, you know, there is a lot of local unemployment where you have got the older industry like mining and steal ( ) have you, which have died and people are unemployed, I think there's got to be a part of the selling point there for them but it's very much a situational thing.

The same concept was expressed by the planning officer of a not for profit organization that opposed the development:

GP What about the economic revenue that people could get from the investment in shares of this local co-operatives, do you think that a possible economic revenue could

compensate in some way the negative perception of the visual impact or noise, do you think that possible revenue...

R I think that could have it a bit, yeah yeah, some people who were prepared to invest the time to go into investigating the financial opportunities might yeah, then you know, that would influence their overall attitude if they felt that yes there was, you know, a contribution to the local economy that could be substantial often remote rural communities are suffering at the moment economically and we are talking of Westmill here, Westmill is in a very affluent area of the country, you know Oxfordshire, every car every house has got three cars and all of that but, well not every house but you know, what I mean it's a very affluent part of England, you know many others, wind farm proposals are in much more remote landscapes in Scotland, Wales and Northern England and so on where potentially...

GP Even affluent people like to invest their money in profitable businesses.

R (They) do, yeah, they are very good at it (laughs) but what I meant was that the advantages to a local community could actually be as a proportion would be more significant in a rural community which is you know, suffering because agriculture is suffering or you know, there's not a lot of industry and not a lot of alternative sources of income.

Another councillor at both parish and district level that opposed the wind farm, points to the fact that the most educated people actually opposed the wind farm:

Peer influence is important because ehm if for instance in Watchfield where the wind farm was, if the majority of the leaders in opinion, over there would to have supported it and would to have invested in it, ehm and you know, I think they would have been in a much bigger uptake but that didn't happen, in fact the more educated people were able to analyse that this possibly would not be such a good thing, you know for various reasons and they thought about that negatively and they influenced other people in a negative way. If the wind farm had been...if proper figures had been produced, you know, upon its viability and how efficient it would be and the return would be and all the other things, if all the negative bits had been taken out and the opinion leaders over there had said "wow this is good we are going to invest in it, I recommend you do it, you know, we care going to make money, we are going to save the earth, we are going to do all the other things that..." then I think the support would have been overwhelming, but unfortunately it turned out the other way, you know.

3.6 Minor costs and benefits in the Westmill case

Minor costs and benefits are several and of different nature. There are some of them that are often recurrent in the transcripts and particularly visual impact and noise. Both of them have been earlier considered in the extreme case in which they are regarded as a source of damage for the population's health, in which case they were considered as health costs.

3.6.1 Visual impact and noise

The concern for visual impact and noise are very common in all the debate surrounding wind farms (Warren et al., 2005) and quoting the transcripts on this would not add much both on the clarification of the issues at stake in the case of Westmill and to the wider knowledge about wind farms' social acceptability.

Visual impact

It is probably sufficient to mention here that the Vale of the White Horse is considered a pleasant and unspoiled landscape of rural England. Apparently there is no big visual intrusion if not on the west and east extremes that anyway sign the limit of the valley. The wind farm site lies in a designated Area of High Landscape Value and is close (6 km) to an Area of Outstanding Natural Beauty (DPDS Consulting Group, 2002). The villages in the Vale are of historical interest and a property of the National Trust of 7.500 acres comprising two villages is neighbour of the site. Finally, the Ridgeway National Trail passes not far from the site and the view from the Ridgeway was always considered rural and virtually unspoiled. It is clear therefore that the wind turbines, which size will be up to 81 metres (DPDS Consulting Group, 2002), may create concern for their visual impact.

All the interviewed subjects that opposed the wind farm: activists, local councillors and members of third party organizations, mentioned their concern and many of them referred also to the concern of local people. When locals were asked how they thought that the landscape would have changed after construction, they replied as indicated in the following tables (4-9) (Weston, 2002).

	No.	Total	%
More Interesting	**166**	**273**	**61**
No Change	**45**	**273**	**16.5**
More Bland	**27**	**273**	**10**
More Boring	**17**	**273**	**6**
More Invigorating	**18**	**273**	**6.5**

Table 4 - Attributes of the landscape expected after the construction of Westmill wind farm 1

	No.	Total	%
No Change	**115**	**314**	**36.5**
More Unpleasant	**102**	**314**	**32.5**
More Offensive	**59**	**314**	**19**
More Pleasant	**31**	**314**	**10**
More Beautiful	**7**	**314**	**2**

Table 5 - Attributes of the landscape expected after the construction of Westmill wind farm 2

	No.	Total	%
No Change	**168**	**314**	**53.5**
More Enclosed	**55**	**314**	**17.5**
More Exposed	**39**	**314**	**12.5**
More Open	**31**	**314**	**10**
More Confined	**21**	**314**	**6.5**

Table 6 - Attributes of the landscape expected after the construction of Westmill wind farm 3

	No.	Total	%
More Active	**161**	**307**	**52.5**
More Busy	**72**	**307**	**23.5**
No Change	**62**	**307**	**20**
More Tranquil	**7**	**307**	**2.5**
More Peaceful	**5**	**307**	**1.5**

Table 7 - Attributes of the landscape expected after the construction of Westmill wind farm 4

	No.	Total	%
More Managed	**130**	**326**	**40**
More Industrial	**74**	**326**	**22.5**
No Change	**60**	**326**	**18.5**
More Commercial	**58**	**326**	**18**
More Natural	**4**	**326**	**1**

Table 8 - Attributes of the landscape expected after the construction of Westmill wind farm 5

	No.	Total	%
No Change	**168**	**309**	**54.5**
More Unsettling	**96**	**309**	**31**
More Threatening	**27**	**309**	**9**
More Safe	**16**	**309**	**5**
More Comfortable	**2**	**309**	**.5**

Table 9 - Attributes of the landscape expected after the construction of Westmill wind farm 6

As can be seen from table 5 the majority thinks that the landscape will be more unpleasant and offensive, this might seem in contradiction with table 4 where the majority of locals

states that the landscape will be more interesting. However, every answer should be considered strictly within the set of options offered to the interviewees and probably doing so would suggest that 'interesting' does not have necessarily a positive meaning but possibly the meaning of 'something that stands out' and not necessarily for its positive characteristics, as the answers in table 5 show, but possibly for its negative ones.

3.7 Pro-environmental attitudes and values: avoiding cognitive dissonance

A long lasting strand of research considers values and attitudes as a primary motivator for pro-environmental behaviour (Stern et al., 1999). In this document a different approach has been taken, considering attitudes as a motivator that comes into play just when a low-cost situation is in place.

This theoretical approach can explain in fact why strong pro-environmental values, attitudes and even behaviours are expressed by subjects that oppose fiercely one or more specific forms of pro-environmental behaviours.

All the subjects interviewed showed to have in variable extent an environmental concern. All but two of them showed a great concern towards climate change, these two did not deny climate change but expressed some doubts.

Maybe the most interesting thing is that the two activists anti wind farm interviewed showed to have quite strong pro-environmental values. One of them is an organic farmer that while interviewed showed proudly a biomass boiler newly installed in a new building that was built on her farm to host a school for children with special needs. She said:

R I think we all have a duty to use as little as we can, ehm to recycle as much as we can, ehm to...like in this building with the sun pipes that we have used to design our building for maximum energy efficiency, ehm we've put in a boiler so that we can use our own willow...

R ...so it's not a matter of not putting our money where our mouth is (...)) are not caring at all, but we are caring in a way that's sustainable, these turbines are not the...the impact that that they have ehm is...it has a destructive effect, ehm what we are doing here is not causing harm to anybody, what we have put this building up is not affecting [...][32] on the hill.

[32] The name of the first promoter of the wind turbine is here used.

She showed enthusiasm particularly towards a specific kind of renewable energy, probably because being a farmer was in the best position to value the potential of such source:

GP well there are other forms of renewable energy like biomass...

R yeah, that so sensible, biomass is so sensible to do that and because it not only looks after the land it gets jobs to the people and it does the job of creating energy and that's absolutely brilliant ehm...

Similarly, the other activist that opposed the wind farm showed a great concern for the environment and in this case particularly regarding climate change. He was conscious that a drastic action was needed to be taken in our society and that everybody needed to do their bit. He also sustained that wind energy could be a useful part of this.

"I am a broadly based scientist, I know perfectly well that the world stock of fossil fuel has been depleted very rapidly as a result of our use of fossil fuel greenhouses gases so called have been pumped into the atmosphere at apparently increasing rate, this is causing climate change, global warming and 'we are heading for disaster' something needs to be done quickly. As a biologist my feeling is that we are not doing anything like enough to adopt a policy of, carbon dioxide capture, there is much talk about renewable energy, but very little about reining in the emissions of carbon dioxide and some other gases into the atmosphere and the only solution as I see it is a massive change of life style for the human community, this I think on a global scale really, although the civilized western nations really have to give a lead in this respect, do we really need to be forever going half way around the world for few days holiday? In a jumbo jet? And, in many other ways we (could) through adopting a change in lifestyle put the brakes on this problem of global warming."

And about wind power:

"Unfortunately persuading the rest of the world to change its way of living is not going to be easy, is not going to happen quickly, so yes we have got to go for renewable energy sources of which there are many, I do believe and accept that wind power in the right place is a very good response because can be put in place fairly quickly, it is an expensive way of reducing CO_2 emission, and I can give you figures of that, but, the problem is

serious and we have to bite the bullet and if it costs a lot of money well, so be it, we still have to do it."

It's fairly clear from these quotations of both the VECS activists that, at least as they are expressed, pro-environmental attitudes are present between the subjects interviewed that opposed the project.

The reason why these attitudes do not activate to lead the subject towards the acceptance of the wind turbines is probably due to their perception of the strong costs that they will have to bear. Particularly these two activists are neighbours of the wind farm site and they expressed their concern for the negative impact that the turbines might have upon them and the local community in general.

In the case of the organic farmer, it is interesting to note that she motivates her opposition also because of the school for autistic children that she hosts in her farm. She is a trained teacher for children with autism and she was concerned with the possible negative impact that the presence of the turbines might have on their sensory environment. Her willingness to host these children and to spend money to build this school on her farm, that was as far as understood just partially compensated by a grant, show altruistic values that are often related in literature with pro-environmental behaviour (Stern et al., 1999). It is not certainly possible to know if this argument is a genuine concern or simply used to strengthen the case against the wind farm but the same dubious attitude could be used to evaluate the real motivations of the proponents in an endless speculation.

Pro-environmental attitudes are largely diffused in all the UK population as many surveys show consistently (Devine-Wright, 2005a) and a positive attitude towards both renewable energy and wind power was found in the local sample of the Oxford Brookes University survey (Weston, 2002). It is therefore imaginable that locals in order to avoid a cognitive dissonance with these prevalent beliefs would have been well disposed to support the project, but actually considering the strong opposition and negative views emerged in the same survey, it might be that they had an objection about this specific wind farm. The only possible explanation for this phenomena of 'Nymbism' is that the perception of major costs ruled out any influence of the pro-environmental attitudes in shaping the behaviours of some members of the local community, whose number is impossible to quantify. However, certainly, the benefit of avoiding cognitive dissonance was the selling point of the project for the supporters that distributed information about climate change

and renewable energy, pointing at the global advantage that such initiatives would deliver if they were diffused everywhere.

3.8 Networks in competition: using communication to magnify costs or benefits

Wind farms are controversial because usually generate a conflict between proposers, their supporters and opposers.

It is worthwhile to focus more on the conflict that happened in Westmill and what it could tell more generally about similar situations.

How an integrated rational choice and attitudes framework could help to understand the dynamics of the conflict surrounding wind farm siting and its purpose?

It appears from the Westmill survey transcripts that social support was considered a weapon to use against the opponents in the planning process, as suggested by the words of one of the ex-councillors interviewed (see quotation in section 3.2). The planning process involves a commission of councillors, elected representatives of their constituencies. Hence, the social support is a way to put pressure on the councillors, in fact if they act against the prevalent opinion of their constituency, they could alienate from themselves the public support and eventually they may lose the elections, in case they wanted to stand again.

It is therefore useful to be able to mobilize people pro or against the project and the way in which that seems to happen is through organized campaigns that magnify costs or benefits of the project. The importance of this public debate to shape attitudes of local residents is highlighted by Wolsink (2007b) who holds that he attitudes are formed in a public debate.

In the case of Westmill, the first organized network created was in opposition of the wind farm and it was built by individuals, neighbours of the proposer, who gathered after that the second planning application passed and therefore they received a letter from the council informing of this event. Hence they joined into a group called VECS, Vale Environmental Concerns, and started acting through recruiting consultants, writing letters to the council and approaching local politicians and newspapers. It is worth to have a close look to one of the flyers produced by this organization. The following text is extracted by the original scan of the flyer and was the first part of the whole text of the flyer itself (TV Energy, 2004):

"Did you know that a local landowner has applied for planning permission to erect 5 huge wind turbines on the north side of the A420 opposite Watchfield and Shrivenham? If this development goes ahead our landscape will be ruined, our lives blighted by high levels of intrusive noise and the value of our properties will plummet. If this catastrophe is to be prevented it is vital that YOU act now[33]. The danger is real and immediate."

This part of the flyer summarized all the points that were then developed in further detail in the following sections of it, even though other arguments were introduced to support their stance too.

Stressing the costs that the wind turbines would have had for the local community was the way that appeared to be used to mobilize people, in doing so these costs seemed to be emphasized.

The costs that were stressed in the flyer of VECS were the major costs listed in the paragraphs and particularly those related with noise, visual impact and devaluation of property prices, being the first two regarded as health costs (noise pollution and distress caused by the visual impact) while the third an economic cost.

Both sides, opposition and support organized actions in order to magnify either the costs (the opposition) or the benefits (the supporters) and hence mobilize people pro or against the wind farm.

The supporters organized public events that were aimed at providing information about the proposal, about climate change and renewable energy.

In its weblog[34] the promoter of the wind farm describes the reasons of creating the WOW group of supporters:

The WOW factor... With every action there always follows a response. VECS was the response to my planning application... WOW was the response to the VECS campaign of misinformation and scare stories.

WOW - Windpower Over Westmill. Local people who had seen the VECS leaflets and TV coverage and knew that it was rubbish wanted to respond. A few phone calls and bit of

[33] This sentence was highlighted in the original text.
[34] The weblog of Westmill wind farm written by its main proposer, has been taken down the web, hence it is not possible to reference it. In 2006 this was copied and used as material for the qualitative analysis together with the transcripts of the interviews.

networking resulted in a meeting of nearly a dozen people around the kitchen table and so WOW was formed.

To respond to the negative campaign of VECS the promoter organized the WOW group (in section 3.2, it was reported also the excerpt by the interview of one member of WOW that states how she was recruited by the promoter). Both groups established a network of individuals and organizations baking their actions. Particularly Friend Of Earth (FOE) and Thames Valley Energy got actively involved in campaigning in favour of the wind farm, while CPRE (Campaign to Protect Rural England) actively supported the VECS.

WOW, FOE and TV Energy organized for example a public exhibition, a public event called 'Oxfordshire and Wiltshire renewable energy festival' and a petition that got signed by over a thousand people. VECS organized instead: public meetings, a petition and a wide distribution of flyers. Both groups approached local newspaper and released press communications and interviews.

3.9 Nimbyism, an outdated concept to define opposition

Nimbyism (not in my back yard) has been widely used to define the behaviour of local residents that oppose wind farms in their locale (Devine-Wright, 2005a), although the term is also used to express local opposition towards facility's siting (Wolsink, 2006).

Unfortunately, as Wolsink (Wolsink, 2000, Wolsink, 2006, Wolsink, 2007b) indicates the NIMBY explanation of local opposition towards wind farms fails to provide an exhaustive account of a phenomenon that appears to be much more complex once motivations are investigated.

In fact the strictly NIMBY attitude about local wind farms should be of rejection of local projects but support of wind farms elsewhere. Wolsink (2007b) instead specifies four kinds of opposition to wind farms:

"I. A positive attitude towards the application of wind power, combined with an intention to oppose the construction of any wind power scheme in one's own neighbourhood (the only true NIMBY-motivated opposition).

II. The not-in-any backyard variant, which means opposition to the application of wind power in the neighbourhood because the technology of wind power as such is rejected. As has been demonstrated, this attitude is based mainly on concerns about landscape values.

III. A positive attitude towards wind farms, which turns into a negative attitude as a result of the discussion surrounding the proposed construction of a wind farm.

IV. Resistance created by the fact that some construction plans are themselves faulty, without a rejection of the technology itself."

This classification shows that there is wider range of possible motivations behind the opposition than the simple NIMBY one. But the reality seems to be even more complex in fact e.g. the so called not-in-any-back-yard case, n. II, could have also different features with a general support towards wind farms but with a particular aversion towards the case of wind farms close to urban settlements or alternatively with an aversion towards wind farms placed in landscape of particular beauty and natural interest.

One of the members of VECS makes clear his opposition towards wind farms showing support for wind power but not when the site is close to a human settlement:

"I think that the varied impact of a wind farm on the environment and communities is such that we ought really at government level to have some clear guidelines that you 'may not' have a wind farm within whatever distance is deemed reasonable of a big human community, to have one nearer remote farmhouse where the farmer could be compensated for being moved away somewhere else if his health is at risk, that is one thing, but to put it down near a community like this one is not in my view reasonable."

Another member of VECS made clear her opposition for turbines on both grounds of spoiling the beauty of countryside and of affecting negatively the health of local community. Although in this case, the first motive seems to be the primary. Again, in this case the subject is on a not-in-any-backyard position but she is not against wind farms in general in fact she states:

"And there is even a place for wind turbines where they have got proper wind and where they can do a proper job, but there shouldn't be an imposition on them..."

She didn't specify where but excluding the countryside, we could imagine either an industrial landscape or off shore.

Another opposer, this time a councillor, showed to be concerned about the impact of wind turbines on the health of the local community and about the landscape impact; he thought that wind power was not the best answer and he mentioned to support this view the intermittency of their generation, but despite being sceptical about wind power he finally, at the end of the interview, said:

"...if they were stocked off shore somewhere where just a passing ship sees them once in a while (laughs) and they not a blight on the countryside then, you know, I think...actually if they are shown to be efficient and working and a good investment I personally would go and invest in them but, you know, it's NIMBYISM, you know what NIMBYISM is? Not in my back yard, you know? We don't want them here, we want them somewhere else (laughs) but the funny thing is that I actually approve renewable energy sources, you know what I mean, I just don't...I have this uneasy feeling that wind farms aren't the way, there must be other things.

GP Mmh maybe this was not for you the appropriate place.

R I think that they could have been farther away from the population, you know, there are fields out there, miles ( ) anywhere you can't see them, you know..."

Another councillor that opposed on the grounds of landscape damage, said that he opposed because at the time of the first application wind farms were rare and he thought that this was not the appropriate site, but he also said that if they were everywhere he would have accepted to have one in their locale, therefore suggesting a fairness issue.

"...I just didn't think that this was the right place at the right time, if we had most of England covered with wind farms, then fine, I don't have a problem having a wind farm here in Watchfield..."

He also thought that they would have made more sense in remote areas where local communities were suffering for lack of jobs, although even there they would spoil the environment but this cost would be overridden by the economic benefits of creating local jobs and possibly a local revenue. Interestingly he also suggested that people living in remote and relatively poor rural communities do not appreciate the beauty of their environment and that actually they would appreciate much more to have local developments and jobs. This hypothesis is in accordance with post-materialist theories that hold the view that just in affluent societies is present a diffused environmental concern (Inglehart, 1977, Diekmann and Franzen, 1999).

"...it's probably better for some of these communities some far from parts of this island to actually have this kind of massive turbines and so on, because they don't realize...they don't recognize the environmental beauties that they have got, our land home and so therefore when they are not there but they've got jobs instead, it won't be such a worry to them, which is a very cynical thing to say I know, but..."

In conclusion, no pure NIMBY attitudes were found, in fact three out of four of the interviewees quoted were a kind of 'not-in-any-back-yard-of-the-kind-of-mine' opposition, therefore all of them were not refusing wind power as such. In fact they were suggesting that wind turbines should be in places with specific characteristics, (e.g. far away from communities, or off-shore). Finally the only exception was the last interviewee mentioned, the only one arguably close to the NIMBY attitude, even though himself too was on a different position, because open to accept wind farms if they were everywhere and suggesting that they should be just where local people can appreciate the benefits that they would provide. Hence, as it is possible to notice, all these positions emerged from the interviews, entailed a sense of fairness and not the discriminatory selfishness generally attributed to the NIMBY model.

A similar position is held by Wolsink (2006) who writes (2007b, p.1203): "...the crucial fact in NIMBY issues is not egotism, nor any other personality trait, but fair decision making that does not cause any perceived injustice." such as interviewees of the Westmill case considered what they named 'spoiling the beauty of the landscape' or 'threatening somehow the health of the local community'.

The approach that has been proposed here, i.e. an integrated rational choice and attitudes framework is not incoherent with the quantitative studies presented by Wolsink (2000, 2007b): in both papers he presents a model to explain opposition that takes in consideration costs, benefits and attitudes towards wind power that shows clearly a predominant influence of the perception of costs in leading to an oppositional behaviour. The model of Wolsink unfortunately does not take in consideration pro-environmental attitudes, further he avoids to present extensively his findings leaving place to a certain degree of ambiguity.

3.10 Conclusions from the qualitative study

The analysis of the qualitative data has been presented in nine different sections, each corresponding to concepts earlier introduced in the literature review and considered potentially useful to explain both acceptability of locally proposed wind farms and engagement in a hypothetical co-operative scheme. ..

Although the nature of a qualitative study is to go in depth rather than surveying a large number of individuals selected in a sample representative of a population, and therefore

its findings cannot aspire to be generalizable, nevertheless these interviews might add a contribution to the current debate about wind farm opposition.

In research questions number one and number two (see section 2.1) it was asked which factors influence acceptability of wind farms and the participation in wind farm co-operatives and how they relate one to the other. These questions led to develop a literature review focusing on the costs and benefits that might influence the decision of supporting a wind farm and participating in a wind farm co-operative, becoming a member. These costs/benefits were recognized as being of different nature: economic, health, psychological and their appreciation being influenced by personal resources (wealth and vicinity) and communication.

A strictly rational choice or alternatively a psychological framework, centred on attitudes, would have possibly lacked some interpretative elements useful to deepen the understanding of wind farms' opposition. An integrated framework seems to be a possibly useful interpretative tool under the light and support of literature advocating for such research development (Diekmann and Preisendorfer, 2003, Stern, 2000, Corraliza and Berenguer, 2000). Costs and benefits influencing the choice have then been divided in major and minor with regards to the specific case of Westmill for an illustrative purpose. Costs and benefits affect a first level of individuals' decision making that might evidence a low-cost or low benefit situation leading to a second level of decisional process that includes other costs and benefits to be considered, which appear related with the personal fulfilment of being consistent with somebody's own attitudes. Costs and benefits for the case of Westmill included: devaluation of property prices, perceived health risks, (severe environmental stress due to noise and visual impact), free services for the local community, opportunity of benefiting of the co-operative revenue, creation of local jobs, cognitive consistency with pro-environmental attitudes, aesthetic visual impact and increased levels of noise.

It has been suggested that personal resources such as income and vicinity to the wind farm site might influence the perceived importance of minor and major factors. It was observed that proximity and affluence increased appreciation of costs in the pre-construction phase. Conversely a greater distance of the interviewees from the site and a lower income would possibly reduce their perception of costs. Finally communication was considered a relevant issue: a lack of ability to promote and communicating properly the aim of creating a community ownership scheme might provoke a lack of credibility and an underestimation of the benefits of the project.

In the case of Watchfield the wealth of the local community, as mentioned by some interviewees, probably downplayed the appreciation of the economic benefits that such project could have provided locally and increased the appreciation of the risks of property devaluation. At the same time the vicinity of the local community to the wind farm site might have increased the perception of health risks that the opposition attempted to magnify through its campaign. Finally the opinion that the original proponent might have used the co-operative scheme to ease the planning process and for building local consent could have played a negative role in the minds of some local residents.

In the research question number three it was asked if the co-operative scheme of community owned wind farms is able to overcome local opposition. The question was based on the hypothesis that the co-operative scheme would have been able to provide a financial benefit for the community suitable to compensate the disutility generated by the environmental impact (Toke, 2002). Interviewees indicated that the compensation was actually poor for the opposers, who would have self-excluded from the share sale. Further, opposers would have felt betrayed and alienated by the part of the local community that would have instead supported and joined the co-operative. Therefore the co-operative scheme have, in the opinion of some, the potential to create an internal and possibly enduring divide within the community with the turbines being a constant reminder of a lost battle for the opposers.

On a more positive note, it is instead the widespread opinion that the scheme might be able to swing undecided towards support, hence reducing the number of the opposers.

Finally the lack of examples of community owned co-operatives of wind farms in place was considered detrimental to its acceptance: people might have found difficult to understand something relatively unusual as this scheme.

In the research question number four it was asked if individuals perceive their status of citizens as a source of moral obligation to protect the environment. In this respect answers appeared to be revealing of different levels of citizenship which were not fully considered by the literature reviewed. Hypothetically, following the categorization of Dobson (2003), it was expected to find a sense of moral obligation to act in favour of the environment as a consequence of a sense of belonging to either the national community, (‘environmental citizenship’), or the global community, (‘ecological citizenship’). Instead, the national level seemed not being involved in motivating a sense of responsibility towards the environment, while a sense of belonging to the local

community emerged as a motive of action that was here termed ‘local citizenship’, i.e. the wish to protect the local community by the supposedly adverse impact of the wind farm on the local environment. Interviewees holding such position showed also an emotional attachment to the local environment that led to think about a likely relation with the concepts of ‘place attachment’ and ‘place identity’. Supporters instead often referred to the importance of acting locally to tackle the global problem of climate change affecting the wellbeing of the world population. Hence a conflict between local and ecological citizenship appeared in this case and it was consistent with what Warren et al. (2005) defined as a conflict between local and global environmentalists in relation to onshore wind turbines.

It seems that the motive to act on behalf of the local or the global community is not in contrast with the selfish drives earlier indicated as basic elements of a rational choice attitudes integrated framework. In fact, after all, individuals are part of their communities and what they recognize as positive for them, in relation to collective matters, is commonly argued as positive also for others sharing the same conditions. In doing so individuals accrue a double advantage: first they externally strengthen their argument by making of it a collective issue and possibly gathering support; secondly they likely foster their self-esteem through promoting a self-image of champions of the public good, hence satisfying an internal need (Maslow, 1987).

It was asked in the interviews how social enterprises and co-operatives are seen by stakeholders and citizens. On this, opinions were predominantly positive but nevertheless three subjects, one opposer and two councillors who opposed the wind farm, showed to have scepticism about this kind of enterprises that they saw as less efficient than traditional ones. Positive opinions toward co-operatives were expressed by the other interviewees which stressed the democratic and more socially just character of these enterprises. It appeared that this issue was not perceived as central in the debate about the local wind farm. Nevertheless, it was instead suggested by the opposers that the co-operative scheme was a sort of propagandistic move or even a way to cover subjective interests of the promoter.

Finally, as earlier discussed in section 3.9, it appeared that the material collected showed a consistency with arguments against a further usage of the NIMBY label as argued by Wolsink (2007b). In fact the egoistic motives assumed by the term NIMBY, (not in my back yard), are dismissed by a sense of fairness transpired by the answers of opposers that rejected the possibility of having the turbines elsewhere in conditions of vicinity to

communities as in the case of Watchfiled. This typology of opposers, that is not captured by the classification proposed by Wolsink, (2007b) was representing the vast majority of the opposers' answers that we collected. The only exception presenting anyway arguments implying fairness towards other communities. Hence despite being coherent with previous research (Wolsink, 2007b), this analysis adds a case more of opposition, whose motivation appears to be a sense of fairness that emerges not only as a wish of not being discriminated against, but also as a wish of rejecting equally "damaging" wind farms elsewhere that might be equally close to local communities.

In conclusion: the framework, proposed in chapter one, integrating rational choice and socio-psychological theories was supported by the analysis and appeared a potentially useful theoretical tool for deepening the understanding of opposition to wind farms. This framework confirms the relevance of issues identified in previous research about wind farms (Warren et al., 2005, Wolsink, 2007b) but attempts to details further those factors suitable of influencing people's attitude towards a locally proposed wind farm, suggesting a possible interaction between attitudes, costs and benefits of material nature and their appreciation in relation with individuals' personal resources.

Finally the analysis of the transcripts offered the opportunity to deepen the understanding of 'citizenship', intended as a sense of responsibility in relation with the environment and local projects of environmental significance, such as wind farms, therefore suggesting a further development of the spatial theory of citizenship, which seems to be closely related to further concepts in the environmental psychological domain, and specifically those of 'place attachment' and 'place identity'.

4 Chapter 4 Design and analysis of the quantitative study

4.1 Themes emerged from the qualitative study informing the questionnaire survey

The conclusions of the first study have argued the suitability of the low-cost hypothesis (Diekmann and Preisendorfer, 2003) to provide a support for the theoretical framework proposed in chapter one, which appeared suitable to interpret the findings of the qualitative study.

The theoretical approach adopted, which led to present in the analysis a classification of primary and secondary costs and benefits influencing individuals' decision-making, might be considered as theoretically plausible as some literature on motivational theories (Maslow, 1987, Wahba and Bridwell, 1976, Inglehart, 1977, Oishi et al., 1999, Sheldon et al., 2001) seems to allow for this elaboration.

Nevertheless, the qualitative data presented, albeit supportive of such classification, cannot be regarded as sufficient evidence for this theoretical approach. The nature of the qualitative research paradigm, bears some well-known general limitations (Corbetta, 2003, Bryman, 2004), such as the limited number of individuals surveyed and what Corbetta (1999, p.432-433) calls the "absence of standardization".

Further, in this case the qualitative study involved a sample of stakeholders, while the theoretical approach just described is meant to provide an explanation of residents' behaviour, which, even though it can be gauged indirectly by stakeholders' experience of the local debate, it seems nevertheless more adequately investigated by directly surveying residents.

In chapter three, cost and benefits were identified as follows in table 10.

Major costs	*Major benefits*
Health costs: Severe noise pollution, distress caused by the visual impact.	Economic: Attractive investment, free services provided to the local community.
Economic: Devaluation of property prices.	
Minor costs	*Minor benefits*
Aesthetic Visual impact of wind turbines	Attitudinal Avoiding dissonance with pro-environmental attitudes
Environmental stressor Noise	

Table 10 Costs and benefits of windfarms

Arguments to endorse the view that vicinity might influence the appreciation of costs and benefits were presented too. A position that emerged in various studies (Braunholtz and McWhannel, 2003, Warren et al., 2005) regards attitudes toward wind farms as related to vicinity to the wind turbines site.

Another factor that was highlighted as suitable to influence the appreciation of costs and benefits was the 'wealth' of residents. Wealth was indicated in chapter three as detrimental to the acceptance of the co-operative wind farm scheme because higher wealth was possibly reducing the capacity of local residents to appreciate the potential economic opportunities brought by the wind farms. Coherently with what was said in chapter one (in section 1.5.4), it seems that the affluence of individuals might influence the perception of their needs accordingly with several studies (Oishi et al., 1999, Sheldon et al., 2001) and therefore might lead them to aim for the satisfaction of other than economic needs, such as psychological or aesthetic needs: the preference towards maintaining the integrity of the perceived amenity of the landscape might therefore prevail in wealthy subjects.

Other theoretical concepts emerging from the qualitative study are 'ecological citizenship' and particularly 'local citizenship', meant as opposed to conceptions of citizenship rooted in the sense of belonging to the global or the local communities.

Hypotheses regarding the specific community owned co-operative scheme were made, suggesting that it might help to swing undecided people but that might also create and maintain a community divide as a consequence of its poor suitability to compensate opposers and because of its exclusivity, resulting from the voluntary membership scheme..

All these issues, here synthetically recalled, were discussed earlier in chapter three and hence were used to inform the quantitative study questionnaire, which was designed aiming to test further the hypothetical theoretical framework outlined in chapter one, along with the specific results of the qualitative study, therefore aiming to determine a quantitative dimension to the factors so far highlighted.

4.2 Questionnaire's development

The main findings of the qualitative study were synthetically recalled in the previous paragraph. This was necessary to introduce the questionnaire that was designed and used.

In building the questionnaire the research questions, (presented in in chapter 2, section 2.1), were ultimately addressed, as the literature prescribes (Corbetta, 1999, Bryman, 2004); this was done through testing the findings of the qualitative study and through surveying some issues which were found to be significant in wind social acceptability of wind farm studies, which were reviewed in the literature review.

A full version of the questionnaire used is presented in Appendix A. This was the questionnaire delivered which had minimal wording variations across cases of study, depending on whether it was delivered to residents living close to a proposed commercial wind farm, or close to a co-operative scheme wind farm. The Appendix A questionnaire layout was slightly modified to accommodate the numbering of the questionnaire's items, which was not included in the original questionnaire delivered. It was not chosen of not numbering the items on the delivered questionnaires in order to make them appear simpler and easier to read. Finally, each of the four cases was surveyed with a questionnaire that bore the specific name of the wind farm and the name of the proposed site.

4.2.1 Choice of questions

The questionnaire and the rationale of using the specific chosen questions are detailed here.

Questions number 1 to 3 collected demographic information. These questions had the purpose, along with others, of addressing the research question n.1 and n.2 (see section 2.1). These were placed at the beginning of the questionnaire because they were considered questions easy to answer, which would have easily started the interviewees and therefore would have possibly increased slightly the response rate, like the work of Edwards et al. (2002) appears to confirm. Nevertheless some of the reviewed literature suggested that no order of questioning was necessarily preferable to another (Wilson and McClean, 1994, Gillham, 2000). With hindsight this approach could have been possibly wrong with regards to demographic questions, which some authors (Oppenheim, 1998, Bradburn et al., 2004) believe that should be posed at the end of the questionnaire, because these could be considered as sensitive questions which might deter the respondents from proceeding in filling the remaining part of the questionnaire.

The demographic questions here asked were limited to education, number of people per household and income. Both education and income could be considered as personal resources that are relevant to carry out a pro-environmental behaviour, which in this specific case of joining a wind farm co-operative has a financial cost, in fact it was asked respondents to tell if they would purchase or not the co-operative shares. The qualitative study suggested that income and education could be issues influencing the support/opposition of the proposed wind farm local co-operative in Watchfield. This was coherent with the literature review presented in section 1.5.4 on affluence/deprivation and education, therefore both these variables were included in the questionnaire.

Household size, i.e. question n.2, was not included because it was believed that household size *per se* had any influence on respondents' resolution to support or not the local wind farm. Household size in fact was found to be irrelevant in relation with environmental concern (Shen and Saijo, 2008). It was instead used to calculate an approximate value which could represent, albeit inaccurately, the income per person of the household.

The cluster of questions n. 4.1 to 4.4 had the purpose of contributing to answer the research question n.1 and were used to ascertain what respondents know about wind energy. These questions are a version with a simplified wording of the questions used in

the study of Klick and Smith (2010). As discussed in section 1.5.4, knowledge about wind energy could influence acceptability of locally proposed wind farms.

Question n.5 was used to contribute in addressing the research question n.1, and served to verify if respondents were aware of the proposed local wind farm. The mere awareness of the project suggests that the respondent has, at least in some extent, gathered some information about the proposal and possibly has developed an opinion. Conversely when the respondent displays a lack of awareness it is more likely that the lack of information regarding the proposal will lead the respondent to either refraining from expressing an opinion or to expressing an opinion which might be less stable because less pondered. The importance of awareness is self-evident but it has been also highlighted in research about pro-environmental behaviours (Bamberg and Möser, 2007).

Question n. 6 contributes to answer research question n.1 and asked respondents if they can see from their home the proposed wind farm's location and, if that's not the case, it was asked how often they see the place. Clearly vicinity to the wind farm increases its visibility and the perception of possible future negative impacts such as noise. In section 1.5.4 a number of studies highlighting the impact of vicinity to a wind farm site on acceptability were presented. Further, the qualitative study, which was earlier presented in chapter three, showed that the vicinity of the designated site was an element of concern and an argument much used by the opposers. Nevertheless, asking respondents how far they lived from the proposed site would have led to inaccurate responses, it seemed that receiving more accurate answers regarding the visibility of the site or its perception was far more likely. Therefore the purpose of questions n.6 was to see how visibility was impacting on support and opposition towards the project.

Questions 7 and 7.1 asked about respondents' opinion regarding the wind farm. A space of free expression was made available for respondents in which they could have possibly presented the major reasons for their support/opposition. This question would later serve in the statistical analysis as the dependant variable for several tests.

Question n.8 asked the respondents about their trust towards the developers and therefore aimed to contribute in answering research question n.1. It wasn't presented a definition of what was meant with the word 'developers' and this might be considered a shortcoming of this question. The question could be arguably considered ambiguous but the broad meaning of the question ultimately conveys the wider meaning regarding developers' fairness in all the phases of the wind farm project proposal elaboration, submission and

planning. Research found that trust towards the actors of the planning process can influence the perception of the project held by the public, as detailed in section 1.5.3, and this appeared to be confirmed by the findings of the qualitative study presented in chapter three.

Question n.9 contributed to answer research question n. 1 and asked about information received by local residents regarding the development. Research presented in section 1.5.3 (in the paragraph on 'trust') and in section 1.5.5 (in the paragraph on 'procedural justice') point to information delivery as an element which contributes to increase the perceived fairness of the planning process and therefore the acceptance of the local wind farm. The developer has the obligation of consulting communities regarding the development (Scottish Government, 2010), this would imply a duty of delivering unbiased information. It was therefore attempted to assess in a synthetic way the perception of residents about the amount of information received. It was believed in fact that, rather than the amount of factual information received, the perception of having been informed might be what meant the most to residents. In the qualitative study in Oxfordshire it was found that residents against the development complained about not having received any information.

Question n.10, that contributed to answer the research question n.1, asked respondents if the wind farm will deliver locally more benefits or disadvantages. In the theoretical framework presented in chapter one and further detailed in the discussion and conclusions of the qualitative study in chapter three, it was hypothesised that a range of benefits and disadvantages might be subjectively assessed by respondents: some of these are local benefits or disadvantages e.g. economic local benefits (jobs, a community benefit scheme if present), visual impact etc. What concerns the most local residents seems to be a cluster of local disadvantages and for some subjects these would override any benefits, local or national/global. This is described as the core of the problem of opposition to wind energy by some authors (Toke, 2002, Groothuis et al., 2008). Nevertheless, in principle, other perceived national disadvantages such as reliability and cost of renewable electricity could bring some subjects to disagree with wind energy. Therefore it was posed this question to verify if there was a relationship between the perception of local advantages/disadvantages and opposition or support.

Questions from n. 11 to 11.8 contributed to answer research question n.1 and asked respondents about specific benefits and disadvantages that emerged in the literature review of published research on social acceptability of wind farms. The costs and benefits

chosen were the ones that were highlighted by the qualitative study, integrated with some additional ones that the literature presented in chapter one pointed to.

In question 11 it was asked to respondents if they agreed with the statement that health of the local community was threatened by the development. This statement might appear to most people as extreme and unfounded but in fact some respondents in the Westmill case expressed concerns about noise and low frequency noise as a type of pollution that might affect adversely the health of local population. An item verifying the expected effect of noise was therefore included. Clearly if subjects were expecting to have a negative health effect from the presence of the wind farm, this might have been a major obstacle in accepting the presence of the wind farm.

The following questions from 11.1 to 11.8 regard the other specific benefits or costs that were identified in chapter one, section 1.5.3 or that emerged from the qualitative study.

Following the questions on costs and benefits, a brief description of what a 'community wind farm co-operative' and what a 'community fund' are was introduced to allow respondents to answer the subsequent questions, even if they had little or no knowledge of the concepts. These descriptions reflected the definitions presented in section 1.5.5.

In question 12, the awareness about any of the two schemes in the locale surveyed was tested. While with questions ranging from 13 to 13.7 a number of questions specifically about the co-operative scheme whose purpose was to address research question n.2 and 3. In this case the wording introducing the questions changed slightly depending whether the scheme was proposed in the specific case or not, therefore introducing the questions with either a statement such as "As a 'community wind farm co-operative' has been proposed for your area…" in the first case, or "If a 'community wind farm co-operative' was proposed for your area…" in the second. In this case again the specific items were either decided on the basis of the findings of the qualitative study or of the literature presented in section 1.5.5 in the paragraph about the co-operative scheme of local ownership of wind farms, particularly they investigated the hypothesis that the co-operative scheme could be perceived as a policy tool suitable to reducing or even overcoming opposition to a proposed wind farm.

Question 14 asked respondents if they would/will invest in a/the co-operative scheme, supposing that each share would cost £ 250. This amount was established accordingly with the case of Westmill. In this case only the 'yes' and 'no' answer modes were

provided, in an attempt to elicit a response that showed the leaning disposition of the respondents.

Questions from 15.1 to 15.7 were asking respondents about the motives of their inclination towards investing or not, therefore addressing research question number 2. The specific items were selected according to the answers collected through the qualitative study, in an effort to be as much inclusive as possible about the potential motives to join or not. Nevertheless with question 15.8 a free space was left in order to allow respondents to include other specific reasons possibly missed.

The question n.16 addresses research question n.3 and asks directly to respondents about their opinion regarding the co-operative scheme.

Question 17, 17.1 and 17.2 address again research question n. 3 indirectly, i.e. asking respondents about their preference between a co-operative scheme and a community fund (permitting nevertheless the option of expressing no preference).

The last part of the survey is dedicated to some attitudinal questions that arguably would have required complex multiple item scales, which could have been possibly more appropriate to survey attitudes The necessity of keeping the questionnaire short, earlier mentioned, made it inevitable to avoid using complex multiple item scales.. Hence, questions from 18 to 20.1 were conceived as an attempt to tap on complex attitudes as environmental citizenship, pro-environmental attitudes and place attachment. Specifically the items n. 18, 18.1, 18.2, 18.3 attempted to assess the three spatial modes of environmental citizenship, thereby contributing to answer research question n.4, which as discussed in chapter three, section 3.1, were considered to be the national, the global and the local, but it was left to respondents also the possibility of denying all of these.

The items 19, 19.1, 19.2 and 19.3 presented respondents with the possibility to choose between answer modes that had an underlying a trade-off between giving priority to the environment and prioritizing the economy. The purpose was to address research question number 1 and particularly to tap on those pro-environmental attitudes that have been considered associated with altruistic values and supposedly being a factor contributing to determine pro-environmental behaviours, like discussed in section 1.2.5 of the literature review. Pro-environmental behaviours in this context doesn’t necessarily mean support to a locally proposed wind farm, like the literature presented in section 1.5.3 (‘environmental attitudes’ paragraph) shows and like it was confirmed by the qualitative study which highlighted as several opposers argued to protect their local environment.

Finally the items 20 and 20.1 tested the environmental and the social dimensions of place attachment, therefore again contributing to answer research question n.1. Place attachment was a concept that was presented and discussed in section 1.5.3 ('place attachment/identity' paragraph) where some studies suggesting place attachment as a motive for opposition were introduced.

4.3 Questionnaire administration, data quality checks and response rate

The questionnaire was administered through postal service after choosing randomly 250 addresses for each site comprised in the two distance bands surveyed of 0-5 and 6-10 km from the wind farm sites[35], therefore a total of 1000 households were selected. Following recommended practice in research (Edwards et al., 2002), in order to increase the response rate, several steps were adopted. The selected households received a first letter, with a questionnaire and a prepaid stamped envelope, introducing the research purpose and stressing the importance of public opinion for the energy policy debate of the country. After a week, a recall letter was sent and finally after another week a third and final letter with another copy of the questionnaire and a further prepaid stamped envelope was mailed. Further, considering that Edwards et al. (2002) indicated in their systematic review the 'length' of questionnaires as the fourth most important characteristic in order to achieve a better response rate, the questionnaire was kept as short as possible, and in its original layout it appeared on three pages printed on both sides and using the 'Arial' font in size 10 for presenting a good readability, as suggested by Bradburn et al. (2004).

The returned questionnaires' data was entered in SPSS[36] and the quality of the data entered was later checked selecting randomly 50 questionnaires, in order to cover uniformly the entire questionnaire set. When a mistake was identified in the entered variables of a questionnaire, the adjacent questionnaires (cases in SPSS) were also checked. Each questionnaire has 51 variables, this means that over 2500 variables were checked and only 6 mistakes were found, i.e. an error rate of 0.24%.

The questionnaires were checked for double responses because they were mailed twice to each household and because in order to preserve the full anonymity they were not identified by any number or code. The questionnaires of the wind farms which returned

[35] The addresses of the population were identified using the Postal Address file of Royal Mail.
[36] 'Statistical Package for the Social Sciences', a proprietary software currently owned and developed by IBM Corporation, which widely used to analyse quantitative social surveys.

the highest number of ‘strongly disagree’ questionnaires, Nigg Hill and Cushnie wind farms were checked, considering that the individuals against the developments might be those more potentially disposed towards using a second questionnaire to stress their views. These questionnaires were compared one by one, each within the same distance band from the wind farm, it being impossible that a household would have received the second questionnaire of a different distance band.

The method used to check the questionnaires was to compare each of them against the others looking for: same calligraphy, consistency in answers and seeking for opposed views particularly but not only on any on the items surveying the motives for opposition, believing that it would be unlikely for any opposer to display strongly different motives for opposition in two questionnaires.

Judging the same questionnaire as written by the same respondent, would require a similar calligraphy and a similar pattern of answers.

A pattern of answers was considered to be ‘not similar’, when on more than three non-demographic questions the respondent gave answers which were different of at least 2 points on a 5 point Likert scale, ‘opposed’, in type of questions with yes/no/I don’t know answers or ‘simply different’ on other type of questions. The demographic questions were also considered in this process (household income, number of household members, level of education) but secondarily to the patterns in opinions.

The result of this lengthy checking process was to identify two questionnaires which appeared to have been written by the same person in the Nigg Hill km 5-10 area. The calligraphy, the pattern of answers and the demographic profile of the respondent suggest so. These were the questionnaires 297 and 75 in the SPSS file. The answers of one of the two record was therefore deleted (n 297 specifically).

The response rate for the questionnaire was 31.5%, 315 questionnaires on 1000 mailed. The response rate was in itself an improvement over the response rate of 17.5% obtained with the pilot and compares favourably with other postal survey research on onshore wind farms which had lower response rates, (only 13.3% in the case of Swofford and Slattery, 2010).

4.4 Variable frequencies and bar charts

In this section the frequencies and bar charts of the variables included in the study are presented. This practice serves both the purposes of showing the composition of the sample, with regards to its demographic variables, and that one of showing the prevalent opinions within the sample, with regards to the questions posed in the questionnaire.

The practice of presenting first the results using frequency tables and histograms is widely recommended in literature (Bryman and Cramer, 2009, Field, 2009). Not only this will serve the purpose to present the first findings of the survey regarding the sample, but will also lay the foundations for a detailed analysis aiming to answer the research questions.

4.4.1 Personal resources and demographic variables

Response rate per site

Considering the composition of respondents, the first variable which is useful to present is the nominal variable of the name of the wind farm, close to which the respondents live, which essentially shows the different amounts of responses across sites.

		Frequency	Percent	Valid Percent
Valid	Cushnie	113	35.9	36.1
	Nigg Hill	82	26.0	26.2
	Meikle C	75	23.8	24.0
	Bracco	43	13.7	13.7
	Total	313	99.4	100.0
Missing	System	2	.6	
Total		315	100.0	

Table 11 - Respondents distribution across surveyed sites

As the reader can notice two records are missing, these were returned questionnaires excluded from the analysis because they appeared to be filled randomly and inconsistently.

The largest number of questionnaires was returned from Cushnie, followed by close numbers from Nigg Hill and Meikle Carewe while Bracco had a substantially lower rate

of return. The rates of return were 45% for Cushnie, 32% for Nigg Hill, 30% for Meikle Carewe and 17% for Bracco.

The reason of the low rate of return for Bracco might be due to the result of a combination of the socio-environmental characteristics of the area. Bracco is the most deprived of the areas surveyed with an average SIMD (Scottish Index of Multiple Deprivation) rank of 2162 versus 2892, 4972 and 5414 for respectively Nigg Hill, Cushnie and Meikle Carewe. Social deprivation has been highlighted as the chief element influencing negatively political engagement (The Electoral Commission, 2005)and van der Horst and Toke (2010) found that deprivation was related with approval of wind farms proposals in planning thereby suggesting that in socially deprived contexts people would have had less resources to lobby against the wind farm developments.

Nevertheless Nigg Hill which is also a relatively deprived context if compared with Meikle Carewe returned more questionnaires. The reasons that can be hypothesized are two: it is possible that being the community living in the area of Nigg Hill in a more rural location than Meikle Carewe (the urban rural classification average is 2.91 for Meikle Carewe versus 5.16 of Nigg Hill) they might perceive more the potential impact on the integrity of their environment by the proposed wind farm. The second possibility is that the population in the Nigg Hill area is older, which in itself is again a factor facilitating political engagement(The Electoral Commission, 2005). The statistics available from the 2001 census, show that the average percentage of the population living in the area who are pensioners, for the datazones covered by the survey, is 18.56%, versus 14.45% in the Meikle Carewe area, (in Bracco area is 15.75%).

If we look in which band distance from the proposed site the respondents live we see that the majority are in the 0-5 km band.

		Frequency	*Percent*	*Valid Percent*
Distance	0-5km	177	56.2	56.5
	5-10km	136	43.2	43.5
	Total	313	99.4	100.0
Missing	System	2	.6	
Total		315	100.0	

Table 12 - Residents' address distance from the proposed wind farm site

The difference is not major, 56.5% live within 5km from the proposed site and 43.5% within 5 to 10 km. The finding appears reasonable, if we consider that closer residents might perceive to be more affected by the impact of the proposed wind farm, this in fact might be seen as consistent with other surveys where it was pointed to the fact that physical closeness to the site might have led to a self-selection bias leading to higher numbers of opponents returning the questionnaires (Jones and Eiser, 2009)or that distance from residential areas was a decisive factor influencing respondents (Meyerhoff et al., 2010), (this matter was discussed more extensively in section 1.5.4).

More questionnaires were returned from the co-operative scheme proposed wind farms Nigg Hill and Cushnie, 62.3% versus the 37.7% from the commercial scheme sites. The reasons of different rates of return from different sites have been discussed above and appear to hold for explaining this difference. Although an additional explanation could be that in the locations where a co-operative scheme is proposed, this forced a wider debate about the wind farm project which rose the interest of the public and made people more inclined to have a say on it.

Education

The majority of respondents have declared as their highest educational attainment ‘secondary school’, 36%, or ‘professional/vocational education’, 30%. ‘Graduates’ and ‘postgraduates’ are respectively 17.5% and 14.5% of the respondents. This shares might simply reflect the distribution of the population surveyed with regards to education (unfortunately it wasn’t possible to source any data which could confirm it).

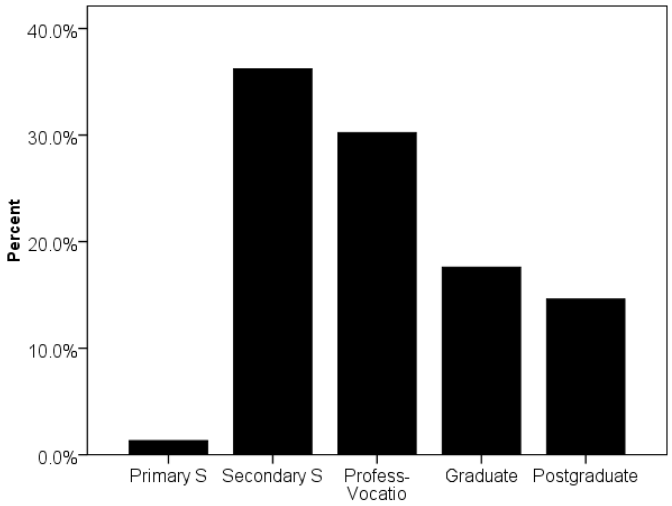

Figure 6 - Level of education declared

The level of education varies sensibly from a wind farm site to another, see table 13. It strikes immediately that 75% of respondents who have attained a primary school level of education where surveyed around the site of Bracco, while 45% of those who declared the attainment of a university degree, and 40% of those declaring a postgraduate degree, where surveyed in the case of Cushnie wind farm. This is actually consistent with the levels of SIMD presented earlier for the areas surveyed, which showed higher levels of multiple deprivation for Bracco and Nigg Hill sites.

			Level of education					
			Primary S	Secondary S	Profess-Vocatio	Graduate	Postgraduate	Total
Name of the wind farm	Cushnie	Count	1	37	29	24	18	109
		% within Name of the wind farm	.9%	33.9%	26.6%	22.0%	16.5%	100.0%
		% within level of education	25.0%	33.9%	31.9%	45.3%	40.9%	36.2%
	Nigg Hill	Count	0	33	23	9	12	77
		% within Name of the wind farm	.0%	42.9%	29.9%	11.7%	15.6%	100.0%
		% within level of education	.0%	30.3%	25.3%	17.0%	27.3%	25.6%
	Meikle C	Count	0	19	30	13	12	74
		% within Name of the wind farm	.0%	25.7%	40.5%	17.6%	16.2%	100.0%
		% within level of education	.0%	17.4%	33.0%	24.5%	27.3%	24.6%
	Braccо	Count	3	20	9	7	2	41
		% within Name of the wind farm	7.3%	48.8%	22.0%	17.1%	4.9%	100.0%
		% within level of education	75.0%	18.3%	9.9%	13.2%	4.5%	13.6%
	Total	Count	4	109	91	53	44	301
		% within Name of the wind farm	1.3%	36.2%	30.2%	17.6%	14.6%	100.0%
		% within level of education	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 13 - Level of education declared and wind farm sites

Income

Respondents, 26% of them, belong predominantly to the household gross income bracket of £30000-49000. While the majority of households declaring their income, 55.3%, have a household income which is £30000 or more.

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Income	Under 10000	41	13.0	14.9	14.9
	10000 -19999	39	12.4	14.2	29.1
	20000 -29999	43	13.7	15.6	44.7
	30000 -49999	72	22.9	26.2	70.9
	50000 -79999	47	14.9	17.1	88.0
	80000 plus	33	10.5	12.0	100.0
	Total	275	87.3	100.0	
Missing		38	12.1		
	System	2	.6		
	Total	40	12.7		
Total		315	100.0		

Table 14 - Gross household income declared in £

The situation varies sensibly from one site to another. Again the SIMD score of the single locations is reflected in the household incomes declared by respondents, although we have response rates which vary sensibly: from only 34 respondents from the area of Bracco to 104 from the one of Cushnie. In the area of Bracco almost 30% of respondents declared to have a household income of less than 10000 £ per year while almost 25% of respondents from the Meikle Carewe site declared more than 80000 per year.

			Household income						
			Under 10000	10000 - 19999	20000 - 29999	30000 - 49999	50000 - 79999	80000 plus	Total
Name of the wind farm	Cushnie	Count	13	16	17	29	17	12	104
		% by wind farm	12.5%	15.4%	16.3%	27.9%	16.3%	11.5%	100.0%
		% within household income	31.7%	41.0%	39.5%	40.3%	36.2%	36.4%	37.8%
		% of Total	4.7%	5.8%	6.2%	10.5%	6.2%	4.4%	37.8%
	Nigg Hill	Count	14	8	11	22	12	5	72
		% by wind farm	19.4%	11.1%	15.3%	30.6%	16.7%	6.9%	100.0%
		% within household income	34.1%	20.5%	25.6%	30.6%	25.5%	15.2%	26.2%
		% of Total	5.1%	2.9%	4.0%	8.0%	4.4%	1.8%	26.2%
	Meikle C	Count	4	10	9	14	12	16	65
		% by wind farm	6.2%	15.4%	13.8%	21.5%	18.5%	24.6%	100.0%
		% within household income	9.8%	25.6%	20.9%	19.4%	25.5%	48.5%	23.6%
		% of Total	1.5%	3.6%	3.3%	5.1%	4.4%	5.8%	23.6%
	Bracco	Count	10	5	6	7	6	0	34
		% by wind farm	29.4%	14.7%	17.6%	20.6%	17.6%	.0%	100.0%
		% within household income	24.4%	12.8%	14.0%	9.7%	12.8%	.0%	12.4%
		% of Total	3.6%	1.8%	2.2%	2.5%	2.2%	.0%	12.4%
	Total	Count	41	39	43	72	47	33	275
		% by wind farm	14.9%	14.2%	15.6%	26.2%	17.1%	12.0%	100.0%
		% within household income	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	14.9%	14.2%	15.6%	26.2%	17.1%	12.0%	100.0%

Table 15 - Household income declared by wind farm site

As we can see in table 14, 12% of respondents have decided of not providing this information, presumably because the question was considered sensitive.

The problem of missing declared income was compounded by the missing answers regarding the number of family members, which resulted in only 236 households for which it was created an estimation of the gross income per person. The single largest

value is £20000 which includes 17.8% of the respondents that have declared both an income bracket and the number of household members.

Most of the households declared the number of their members are composed by two persons, 49% of the respondents.

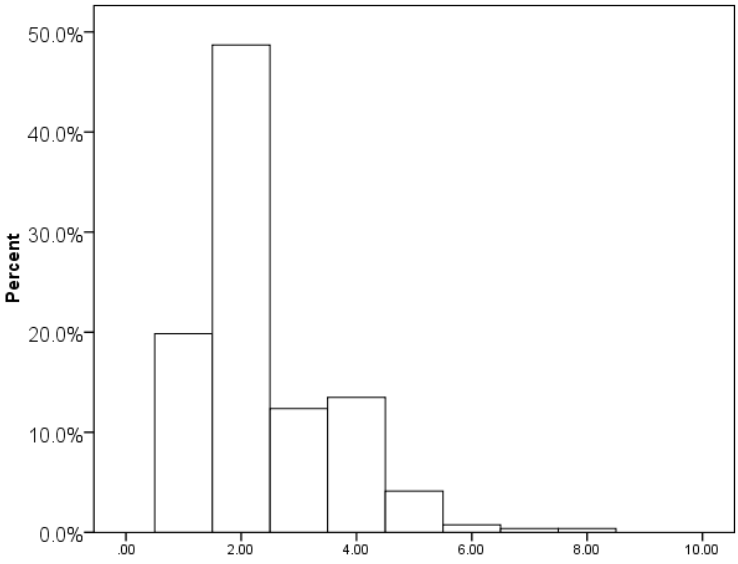

Figure 7 - Number of household members declared

Knowledge about wind energy

A range of questions asked looked at knowledge of respondents regarding wind power characteristics. These were pollution, cost of producing electricity through wind generation, intermittency and whether wind was considered to be a renewable source of energy.

The overwhelming majority of respondents 89.5% said that wind generation pollutes less than coal-fired power stations.

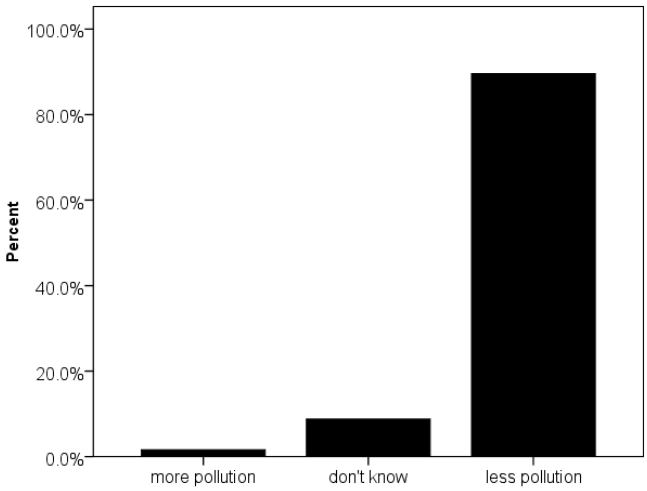

Figure 8- Answers to the question 'How much pollution do wind turbines produce in comparison with coal-fired power stations?'

The majority 51% of respondents considered wind power a cheaper means of producing electricity than coal.

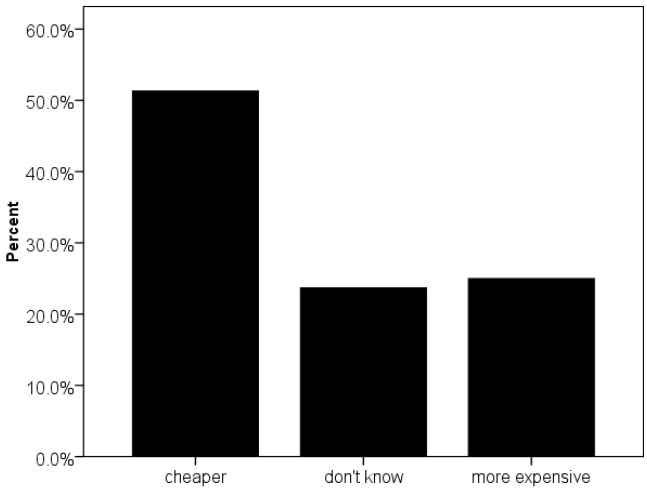

Figure 9- Answers to the question 'Is electricity produced by wind turbines cheaper or more expensive to produce than electricity produced by other means such as coal-fired power stations'?

60% of respondents believed that wind did not produce a steady stream of electricity independently from the location. Respondents from the Bracco area showered a different pattern of answers compared with the other sites, with over 40% of them answering 'I don't know' and about 30% responding for each of the other two answers (i.e. 'yes' and 'no').

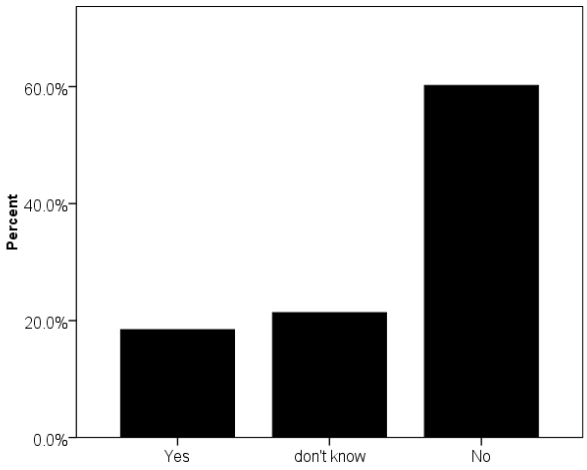

Figure 10 - Answers to the question 'Whatever the location, do wind turbines produce a steady stream of electricity?'

The vast majority of all respondents, 88%, consider wind to be a type of renewable energy but about 20% of the respondents from the Bracco area answered 'I don't know'.

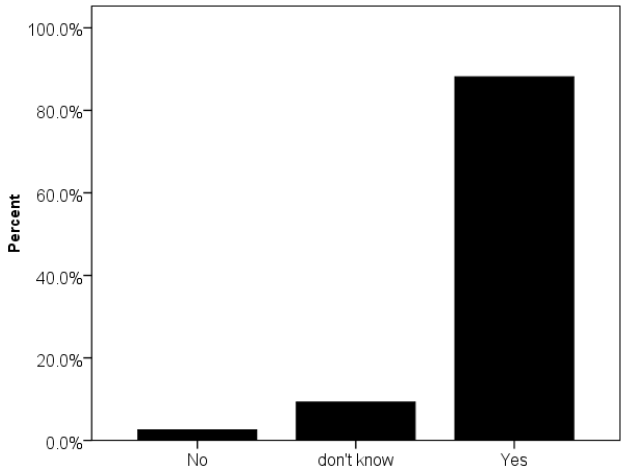

Figure 11 - Answers to the question 'when people talk about renewable energy, do they consider wind power to be a type of renewable energy?'

Community scheme awareness

When respondents were asked if they were aware of a community scheme being proposed for the wind farm, the vast majority, 87%, answered that they were not aware (see figure 12). Respondents 'not aware' reached the peak in the area of Meikle Carewe, (one of the two purely commercial scheme wind farms), where 97% responded so (figure 13). On the contrary the lowest number of 'not aware' respondents, 75%, regarded the case of the proposed wind farm of Nigg Hill, (one of the two co-operative schemes).

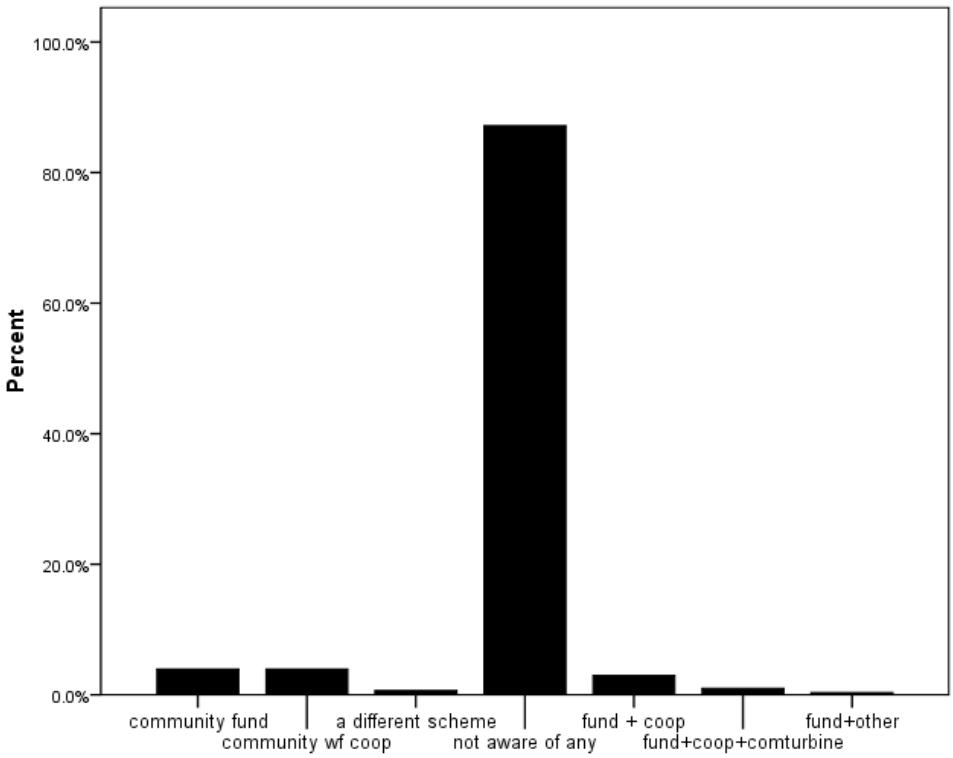

Figure 12 - Awareness regarding the proposed co-operative scheme for all respondents

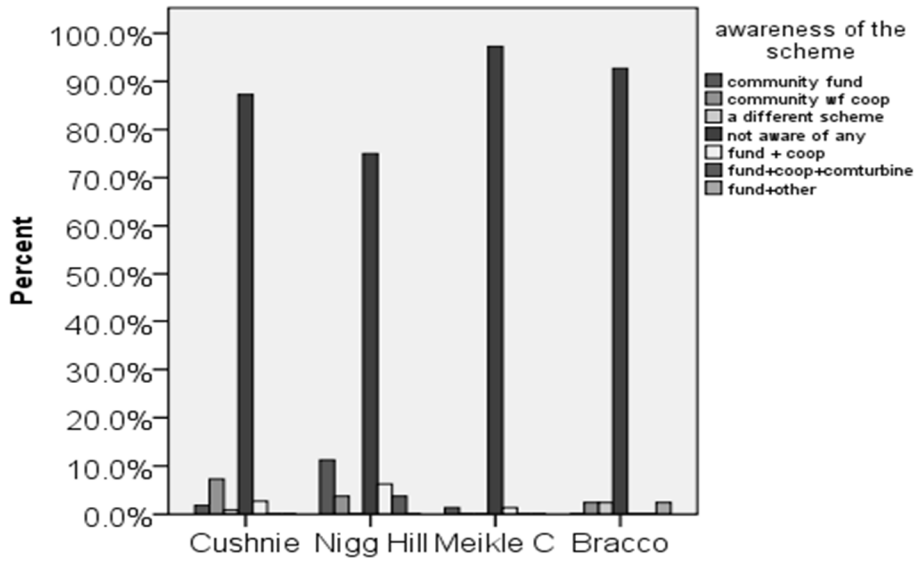

Figure 13 - Awareness regarding the proposed co-operative scheme for respondents by wind farm site

In the case of Nigg Hill where the lowest percentage of not aware is registered, 14% reported to be aware of a scheme which includes the co-operative (see table 16). The percentage of respondents reporting to know about a scheme which includes the co-operative is instead 10% in the case of Cushnie, the other co-operative scheme case surveyed.

		community fund	*community wf co-op*	*a different scheme*	*not aware of any*	*fund + co-op*	*fund+ co-op+ com. turbine*	*fund+othe r*	*Total*
Name of the wind farm	Cushnie	1.8%	7.3%	.9%	87.3%	2.7%			100.0%
	Nigg Hill	11.2%	3.8%		75.0%	6.2%	3.8%		100.0%
	Meikle Carewe	1.4%			97.3%	1.4%			100.0%
	Bracco		2.4%	2.4%	92.7%			2.4%	100.0%
	Total	3.9%	3.9%	.7%	87.2%	3.0%	1.0%	.3%	100.0%

Table 16 - Awareness of the proposed community scheme for the local wind farm

4.4.2 Awareness and opinion about the locally proposed wind farm

When respondents were asked about their awareness of the proposed wind farm, percentages varied across the proposed sites with Cushnie and Nigg Hill respondents declaring to be very aware, while Meikle Carewe respondents produced substantially equal percentages of respondents aware and not, and finally Bracco presented a situation where the vast majority of respondents were not aware. Again a possible explanation could be that where a co-operative scheme was proposed, the debate stirred made people more aware.

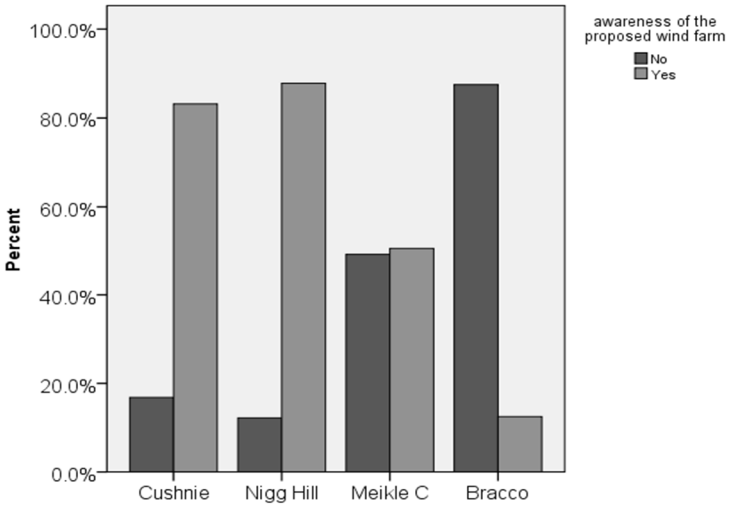

Figure 14 - Answers to the question 'are you aware that the '….' wind farm has been proposed in your local area?

When respondents were asked if they could see the wind farm site from home the majority of respondents said no, 46%, while 23% declared of not knowing where the site was.

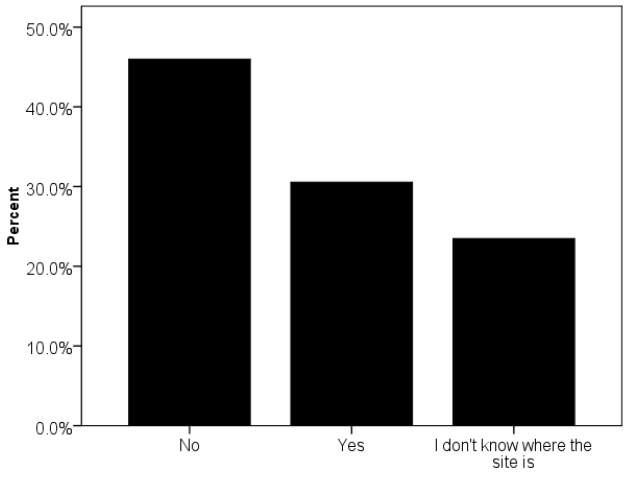

Figure 15 - Answers to the question 'Can you see from your home '……..', the site of your proposed local wind farm?'

The answers differed between the areas surveyed with nearly 60% respondents from the area of Nigg Hill answering 'yes' and over 60% from the Bracco area answering 'I don't know where the site is' (see figure 15).

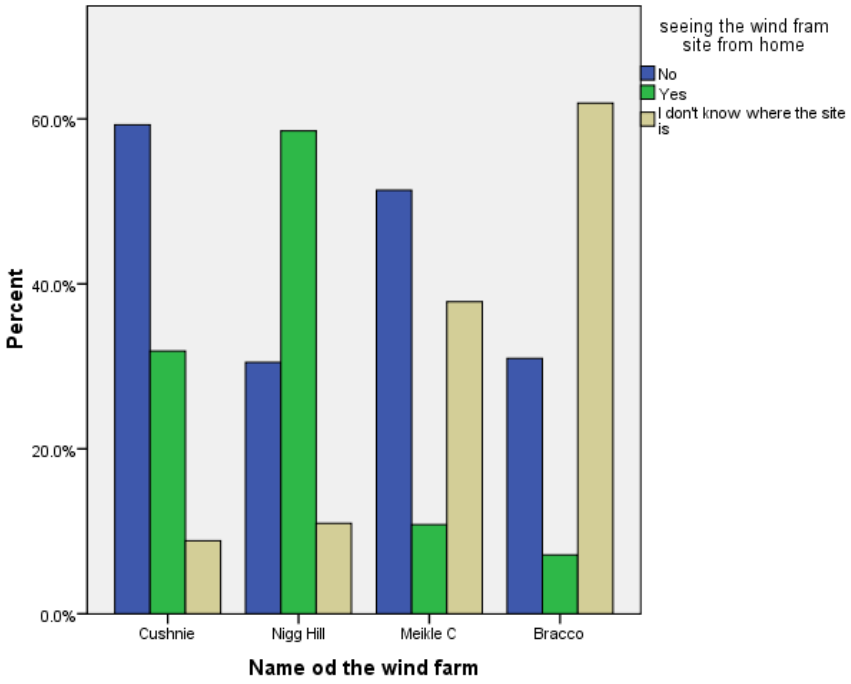

Figure 16 - Answers to the question "Can you see from your home the 'name of site', the site of your proposed local wind farm?" detailed per area surveyed.

Of those that answered no, the majority of them said that they saw the site sometimes, 36.5%, and 24.5% said 'often'.

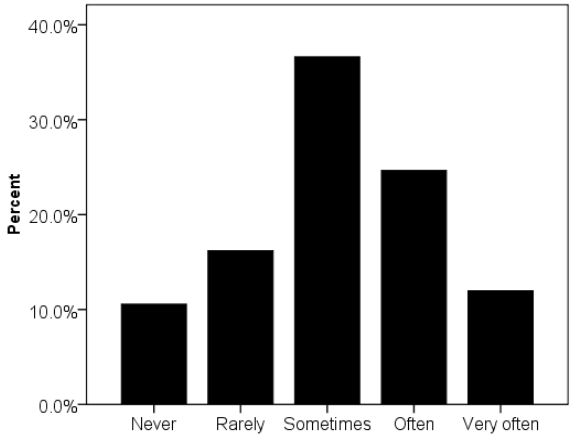

Figure 17 - Frequency of sight of the wind farm sight for respondents who don't see the wind farm from home

Opinion about the locally proposed wind farm

One of the important variables of the study is the opinion of respondents regarding the locally proposed wind farm. If we look at all respondents, we see that the respondents who agree are 28.2%, immediately followed by 'neither nor disagree' respondents,

26.9%, while the ‘strongly disagree’ are 20.1% and the ‘strongly agree’ are 14.6%, finally the ‘disagree’ are 10.1%.

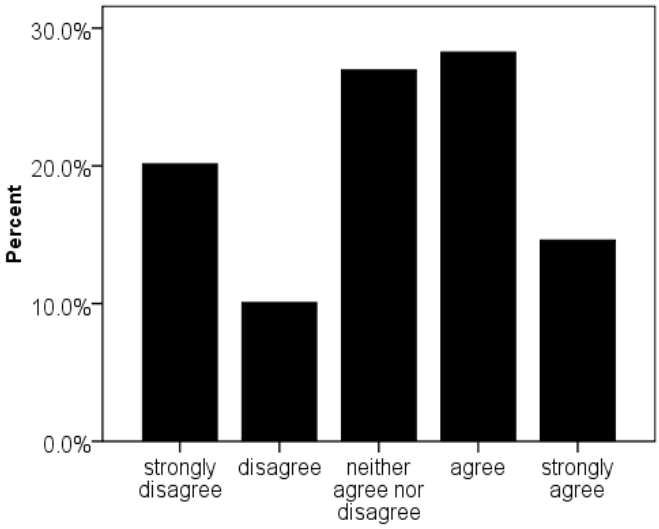

Figure 18 - Answers to the question ‘What do you think of the presence of this wind farm in your area?’

In the questionnaire it was left a blank space to specify the motives for the answer provided for the above question.

These are presented here in three tables divided for three group of respondents, group 1 including the ‘strongly disagree’ and the ‘disagree’ respondents, group 2, ‘neither agree nor disagree’ and group 3, ‘strongly agree’ and ‘agree’. The results were obtained grouping all the types of motives indicated, which didn’t achieve 9% of frequency in at least one group of respondents, (supporters, undecided and opposers), within the ‘other’ category.

As the tables 17, 18 and 19 show, supporters (group 3) mainly cite the fact that wind is a renewable energy (18.2%), which they consider ‘better than other sources’ of energy (11.4%). Undecided instead, (table 18), mostly define themselves so because of ‘lack of sufficient information’ 26.5%. Opposers, finally, indicated as main motive the ‘visual impact’, 41%, followed by ‘inappropriate location’, 18%.

		Motive of opinion						
		benefits the environment	renewable /sustainable energy	not bothered	other	better than other sources	energy security	Total
Supporters	Count	13	24	1	69	15	10	132
	%	9.8	18.2	0.8	52.3	11.4	7.6	100.0

Table 17 - Motives of opinion of supporters of the locally proposed wind farm

		Motive of opinion								
		negative visual impact	benefits the environment	renewable /sustainable energy	inappropriate location	not bothered	other	better than other sources	lacking sufficient info	Total
Undecided	Count	1	2	4	1	5	47	1	22	83
	%	1.2	2.4	4.8	1.2	6.0	56.6	1.2	26.5	100.0

Table 18 - Motives of opinion of undecided about the locally proposed wind farm

		Motive of opinion					
		negative visual impact	inefficient /intermittency	inappropriate location	other	lacking sufficient info	Total
Opposers	Count	38	10	17	26	2	93
	%	40.9%	10.8%	18.3%	28.0%	2.2%	100.0%

Table 19 - Motives of opinion of opposers of the locally proposed wind farm

The picture regarding opinions about the proposed wind farm is very different across different sites. If we look at the specific sites, it is possible to note that different sites have different prevailing values. Cushnie and Meikle Carewe have a prevalence of ‘agree’, while Bracco has a prevalence of ‘neither agree nor disagree’, and Nigg Hill has a prevalence of ‘strongly disagree’. In table 20 the frequencies are specified. With

exception of Bracco, the whole of respondents in agreement (the sum of ‘strongly agree’ and ‘agree’ answers) are the largest number in each site when compared with those undecided and those who disagree.

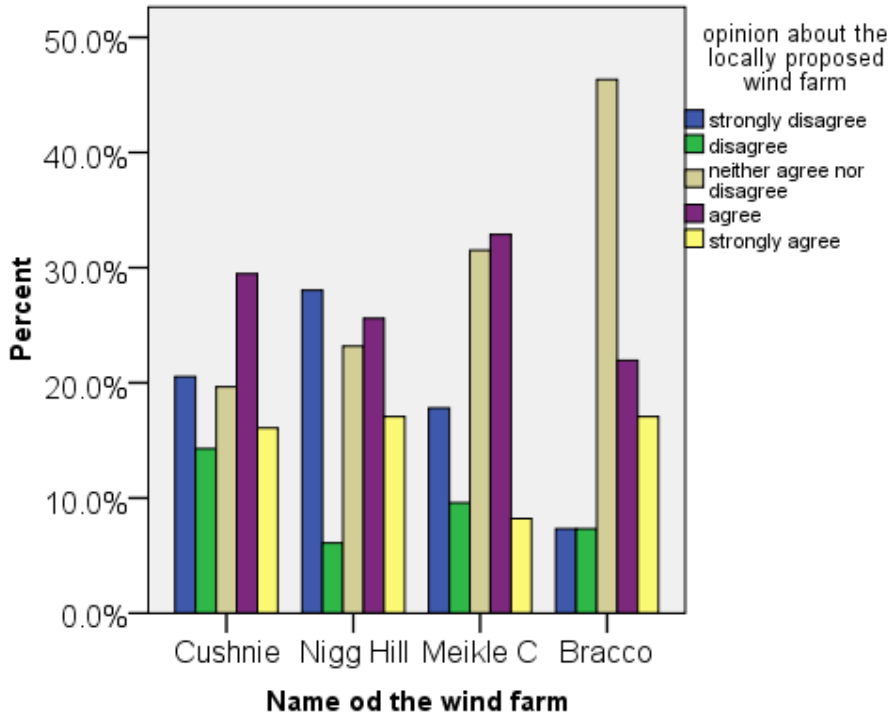

Figure 19 - Opinion regarding the locally proposed wind farm across surveyed sites.

		strongly disagree	*disagree*	*neither agree nor disagree*	*agree*	*strongly agree*	*Total*
Name of the wind farm	Cushnie	20.5%	14.3%	19.6%	29.5%	16.1%	100.0 %
	Nigg Hill	28.0%	6.1%	23.2%	25.6%	17.1%	100.0 %
	Meikle C	17.8%	9.6%	31.5%	32.9%	8.2%	100.0 %
	Bracco	7.3%	7.3%	46.3%	22.0%	17.1%	100.0 %
	Total	20.1%	10.1%	26.9%	28.2%	14.6%	100.0 %

Table 20 - Opinion regarding the locally proposed wind farm across surveyed sites.

4.4.3 Attitudinal factors

A range of attitudinal questions regarding perceived costs and benefits, environmental citizenship, environmental attitudes and place attachment were asked.

Environmental citizenship

This question (items 18- 18.3 in the questionnaire) aimed to ascertain which if the respondents felt a responsibility to act pro-environmentally and if so at which level they did. Respondents seemed to be polarized between preference for the statement 'we all have to do something to protect the global environment because we all share planet earth' chosen by 46.5% of respondents and the statement 'we all have to do something to protect our local environment, because it's the place where we live with our families, in our communities' chosen by 38% of respondents. The answer seem to stress an attachment mostly to the local and to the global environments while disregarding the national dimension or the option of rejecting any responsibility for environmental matters, which in the fourth item (18.3) were attributed to the sole responsibility of the Government.

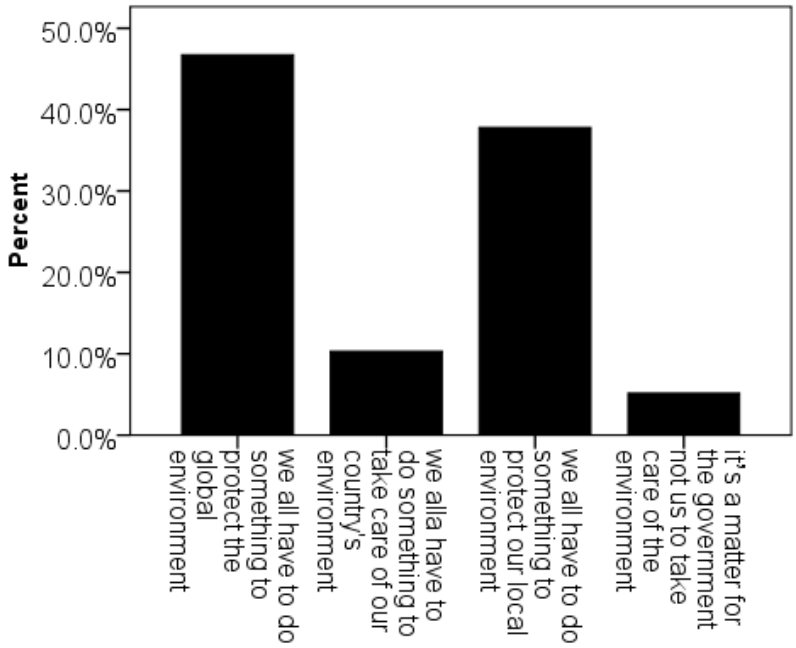

Figure 20 - Perceived environmental responsibility and its level of action

Pro-environmental attitudes vs pro-economy attitudes

The following question asked respondents to place a preference on one of four statements representing a hypothetical trade-off between economic growth and environmental protection (items 19 -19.3 of the questionnaire). The majority of respondents 54.5% chose the statement 'the economy should be the priority of the government but this should not damage the environment', while 34.5% chose the statement 'the environment should be the priority of the government but this should not damage the economy'.

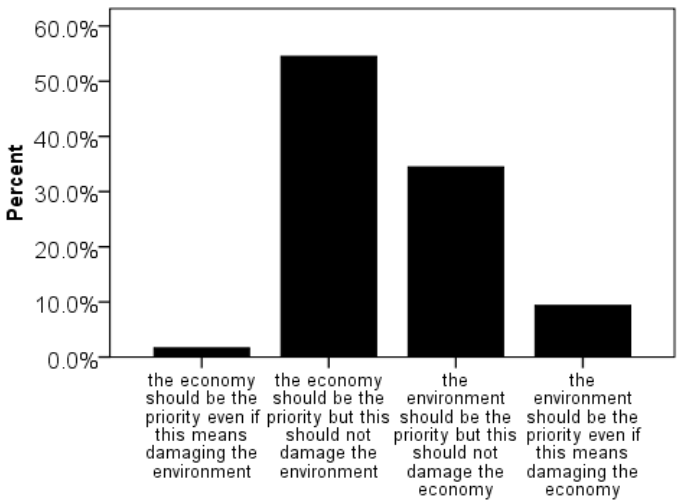

Figure 21 - Preferences between prioritizing economic growth or environmental protection

Place attachment

Two statements asking about place attachment were presented to respondents. The first aimed to capture the attachment to the physical environment (item n.20 in the questionnaire). Results are presented here with a bar chart detailing values across wind farm locations (figure 22). They show that ‘strongly agree’ was by far the preferred category in all the locations but Bracco, where instead the preferred category was ‘agree’. Bracco presented also much larger proportions of ‘neither agree nor disagree’ and ‘disagree’ when compared with the other locations, where such answers were given in negligible numbers.

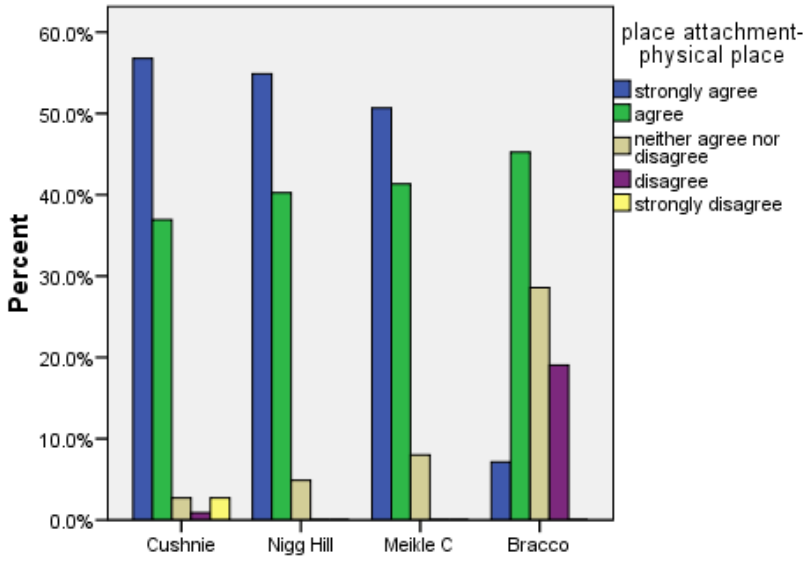

Figure 22 Answers to the statement ‘I like how my area looks’

When asked about attachment to the social environment, with the statement ‘I like my community’, (item n.20.1 of the questionnaire), the majority of respondents answered strongly agree. Again the Bracco residents presented a pattern of answers with a prevalence of ‘agree’ and comparatively higher proportions of ‘neither agree nor disagree’ and ‘disagree’ (figure 23).

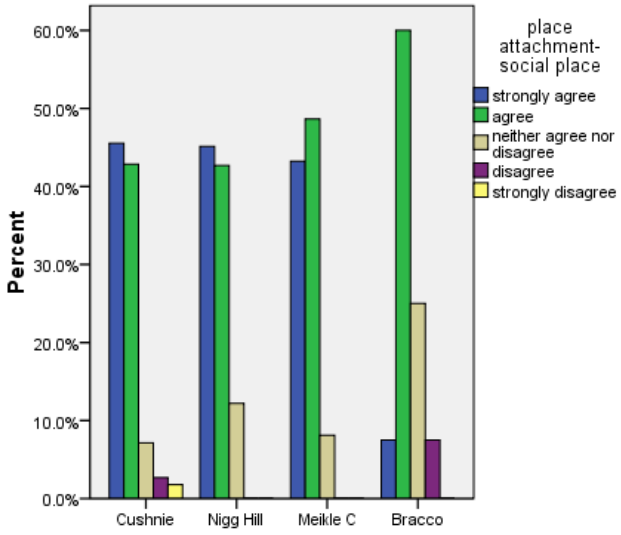

Figure 23 - Answers to the statement 'I like my community'

Perceived local costs and benefits

Respondents, who were asked about their perception of receiving local benefits or disadvantages brought by the proposed wind farm, answered predominantly 'more benefits than disadvantages', 42% (figure 24). About 34% believed that the wind farm would have brought 'more disadvantages than benefits' or 'many disadvantages and no benefits' versus 46% that thought the opposite. Looking at individual results, it strikes that in the area of Nigg Hill there were more respondents believing that the wind farm would have brought more disadvantages than benefits, although the difference in percentage with those thinking the opposite is not substantial, 43% vs 41%.

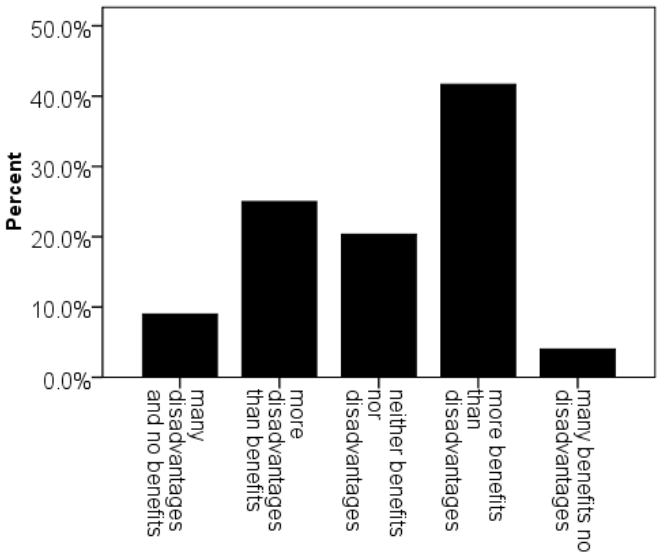

Figure 24 - Answers to the item "I think that the local wind farm will bring locally…"

It was asked specifically about 9 benefits and costs associated with the wind farm in case it was built (items 11 -11.8 of the questionnaire).

Health impact

The first of these items regarded negative health consequences associated with the presence of the wind farm; 41% of respondents disagreed with the statement "The wind farm will harm the health of my community" (see figure 25), this combined with respondents that strongly disagreed shows a majority of 66% respondents disagreeing with the belief that the wind farm might harm the health of the local community. Although the disagreement with the statement was overwhelming in all the areas, in the area of Bracco almost 40% of respondents answered 'neither agree nor disagree'.

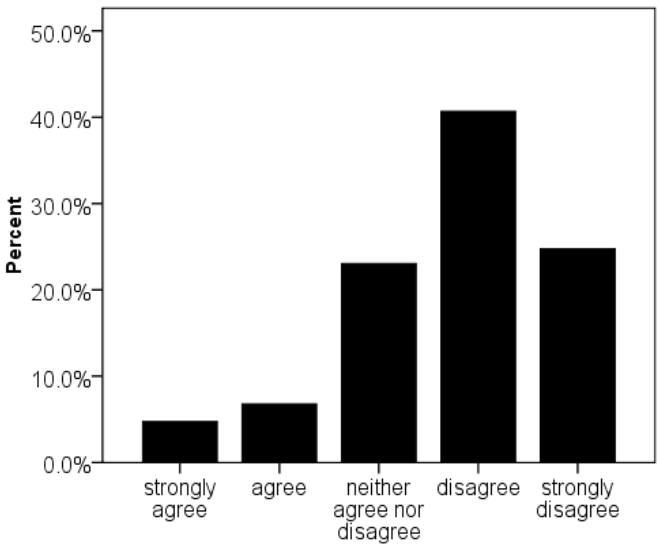

Figure 25 - Answers to the statement "The wind farm will harm the health of my community"

Climate change impact

Respondents were asked about the contribution of the wind farm with regards to climate change. Answering the item 'the wind farm will help to fight climate change' 43% agreed with the statement and the combined 'agree' and 'strongly agree' answers amounted to 56% of respondents (figure 26).

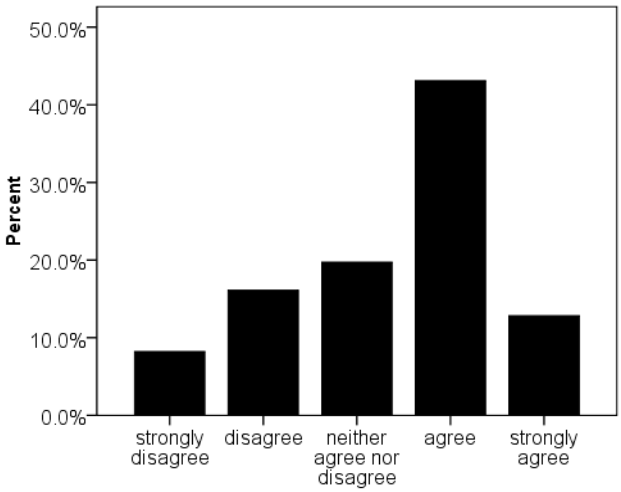

Figure 26 - Answers to the statement 'the wind farm will help to fight climate change'

Visual impact

Asked about the negative visual impact of the wind farm, 26.5% of respondents neither agree nor disagree with the statement 'the wind farm will look bad on the landscape'. Nevertheless, an equally large number of respondents strongly agreed with statement 26%, further when these respondents are added to those that 'agree' the combined percentage is 41.5%, therefore indicating a large number of respondents considering the visual impact as negative which outnumbered those disagreeing or strongly disagreeing (figure 27). In the area of Bracco those answering 'neither agree nor disagree' were notably higher than in the other areas reaching almost 40%.

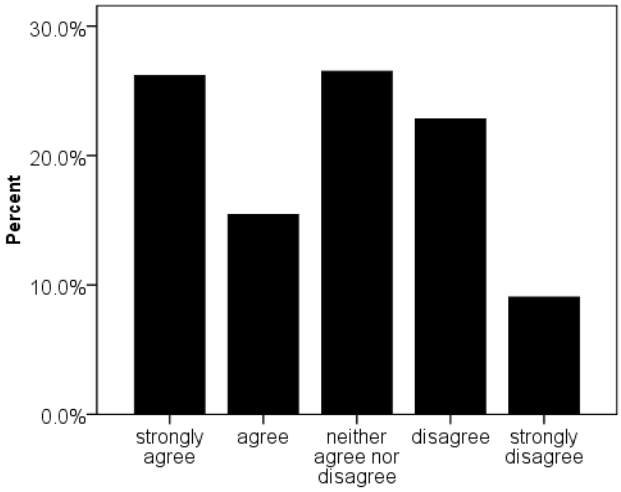

Figure 27 - Answers to the statement 'the wind farm will look bad on the landscape'

Impact on the local economy

Respondents asked if the wind farm will improve the local economy were mostly answering ‘neither agree nor disagree’ 35%, nevertheless 37% of respondents were either ‘strongly disagree’ or ‘disagree’ (in figure 28). The picture changes across sites, with those believing in the wind farm improving the local economy at the highest level in Nigg Hill with an overall 38%.

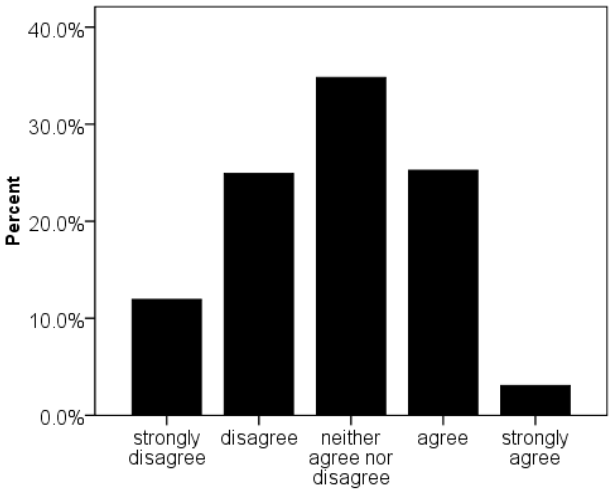

Figure 28 - Answers to the statement ‘the wind farm will improve the local economy’

Impact on property prices

When asked about the negative impact on local property prices the respondents largely answered ‘neither agree nor disagree’ 36.5%, nevertheless the combined ‘agree’ and ‘strongly agree’ answers amounted to 37.5% (in figure 29). This percentage rose to little more than 50% in the area of Nigg Hill.

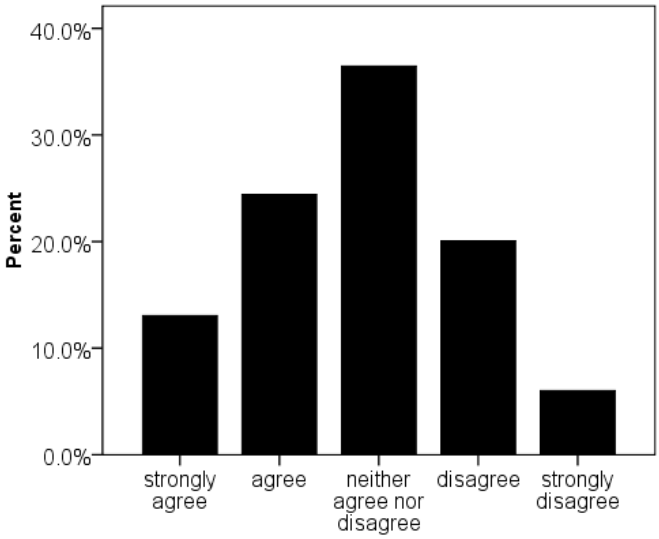

Figure 29 - Answers to the statement 'the wind farm will bring down the local property prices'

Impact on local tourism

Respondents were asked about the wind farm as a feature of the local environment which would have attracted tourists. The vast majority disagreed 38.5% and 28.5% strongly disagreed (in figure 30).

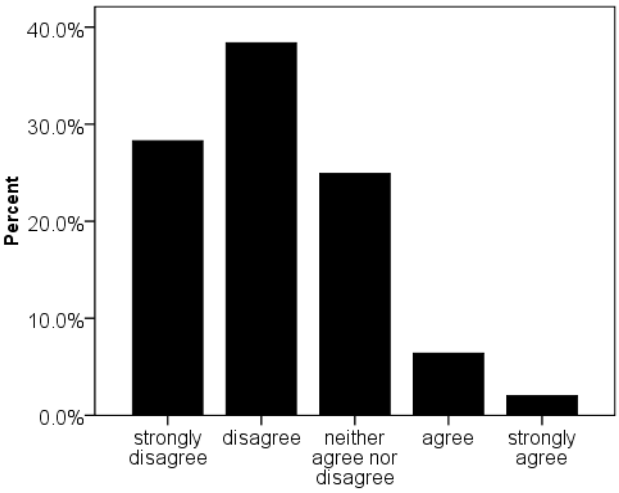

Figure 30 - Answers to the statement 'the wind farm will attract tourists'

Noise impact

Respondents were asked their opinion about the wind farm being noisy, 38% of respondents neither agreed nor disagreed while 38% either disagree or strongly disagree (in figure 31).

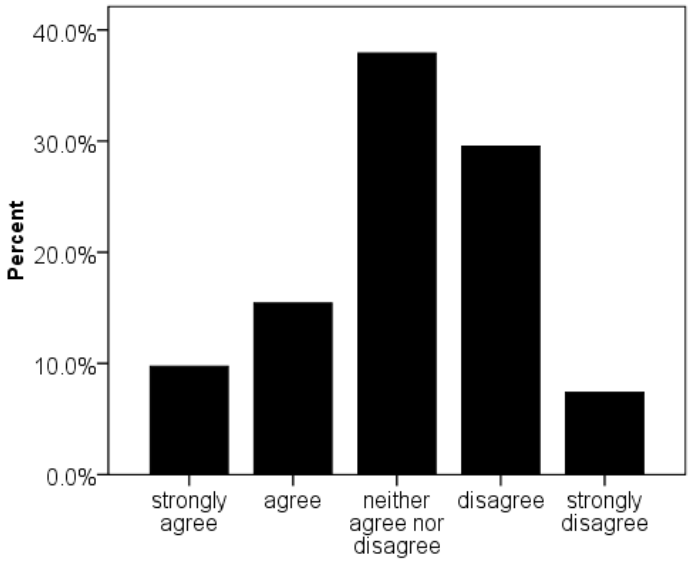

Figure 31 - Answers to the statement 'the wind farm will be unpleasantly noisy'

Cost of electricity

The statement affirming that the wind farm will generate costlier electricity was answered with a 35.5% of 'neither agree nor disagree' although 37% or respondents disagreed or strongly disagreed with the statement (figure 32).

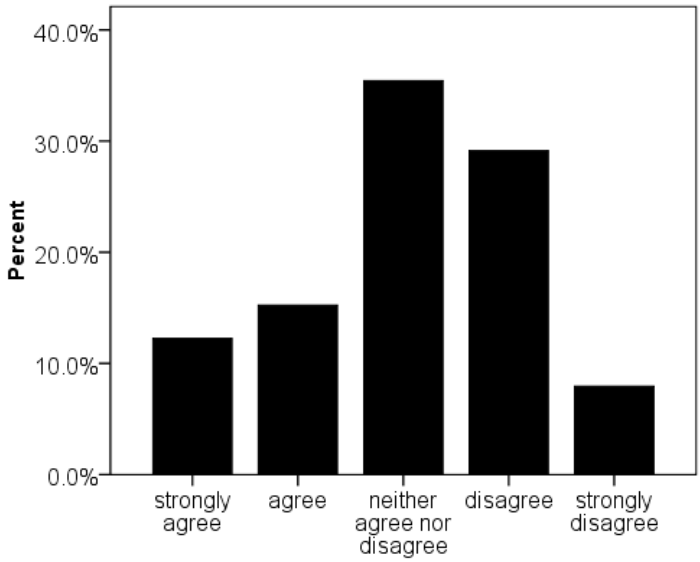

Figure 32 - Answers to the statement 'the wind farm will generate costlier electricity than if it was generated by ordinary fuel'

Dependency on foreign fuels

The statement 'the wind farm will help to free the country from dependence on foreign fuel' obtained 40.5% of 'agree' answers (figure 33).

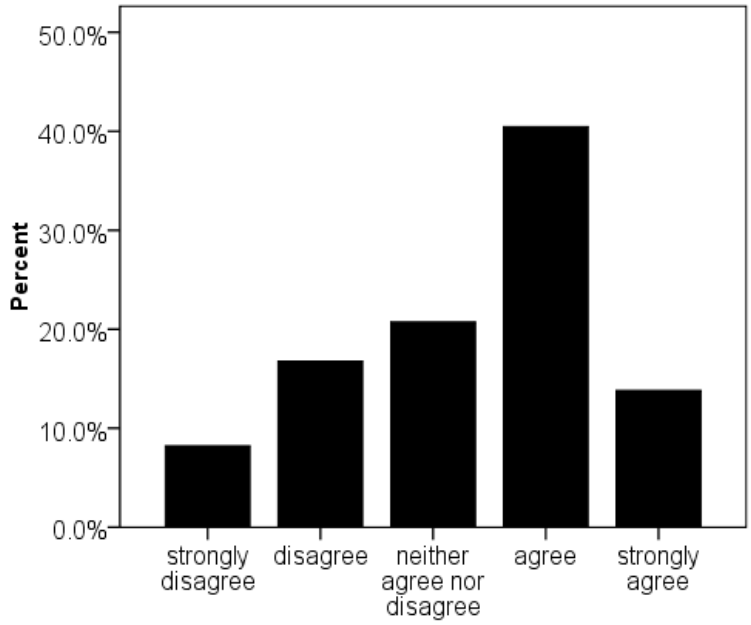

Figure 33 - Answers to the statement 'the wind farm will help to free the country from dependence on foreign fuel'

4.4.4 Contextual factors

Contextual factors surveyed were limited to the co-operative scheme and the perception of its advantages and disadvantages, the availability of respondents to join a co-operative scheme and their reasons of choice

Trust and procedural fairness

When respondents are asked if they "trust the developers of the wind farm in the way they deal and have dealt with the local community", the majority of respondents answered 'neither agree nor disagree', 44.5%, although more people disagree rather than agree on this statement (figure 34).

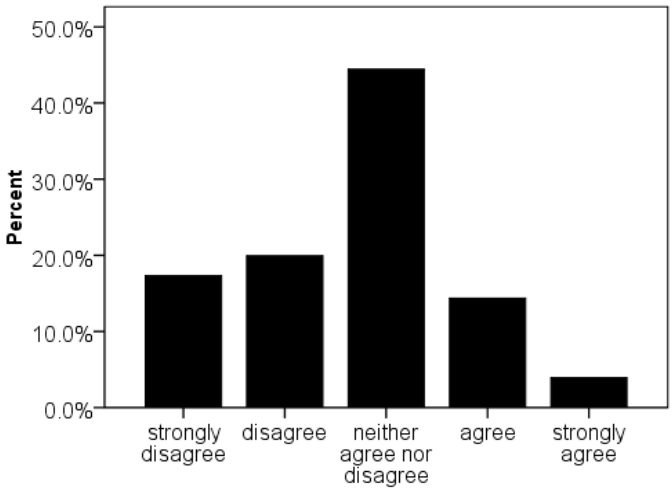

Figure 34 - Answers to the statement "I trust the developers of the wind farm in the way they deal and have dealt with the local community"

Information

Responding about the level of information received, residents surveyed expressed largely disagreement, nearly 60% of respondents 'disagree' or 'strongly disagree' (figure 35).

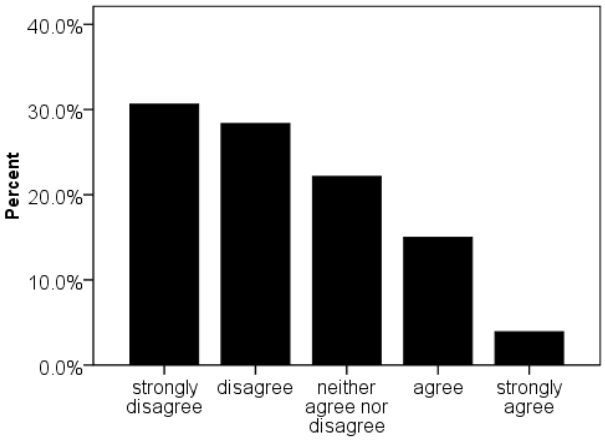

Figure 35 - Answers to the statement "I feel that I have been thoroughly informed about the wind farm"

The co-operative scheme

The items from 13 to 13.7 of the questionnaire were used to survey the opinions of respondents regarding the wind farm co-operative scheme. This part of the questionnaire obtained less answers than the first part. Possibly some respondents were not confident to state an opinion regarding either the proposed wind farm co-operative or a hypothetical wind farm co-operative scheme. Even in the cases of sites where the co-operative scheme was offered, respondents showed of not being aware of it, therefore very few might have been familiar with the idea of a wind farm co-operative.

We asked respondents if they agreed with the statement that 'the co-operative will be just a ploy to buy residents' consensus'. 32.5% of respondents answered 'neither agree nor disagree' while the joint 'agree' and 'strongly agree' responses amounted to 44% (see figure 36).

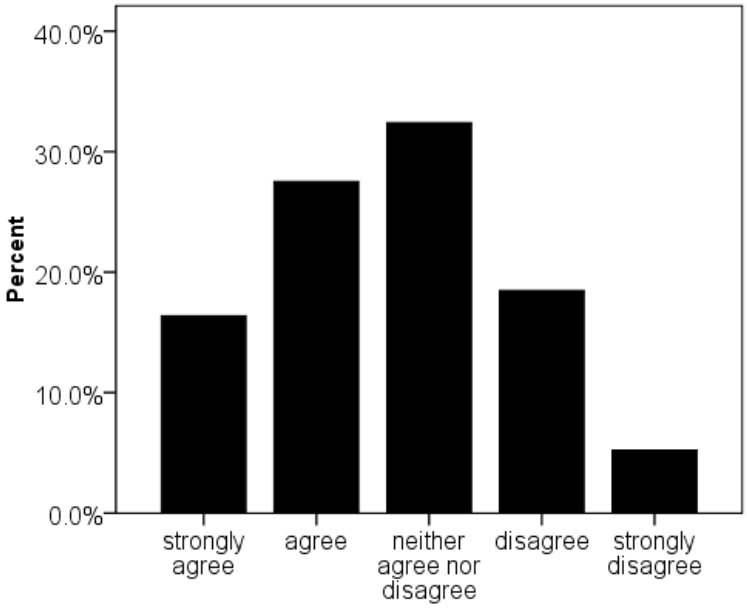

Figure 36 - Answers to the statements 'the co-operative will just be a ploy to buy residents' consensus[37]

Respondents largely acknowledged that the co-operative would give the chance to local people to benefit from the revenue of the wind farm. 48% of respondents agreed with the statement and 3% strongly agreed (figure 37).

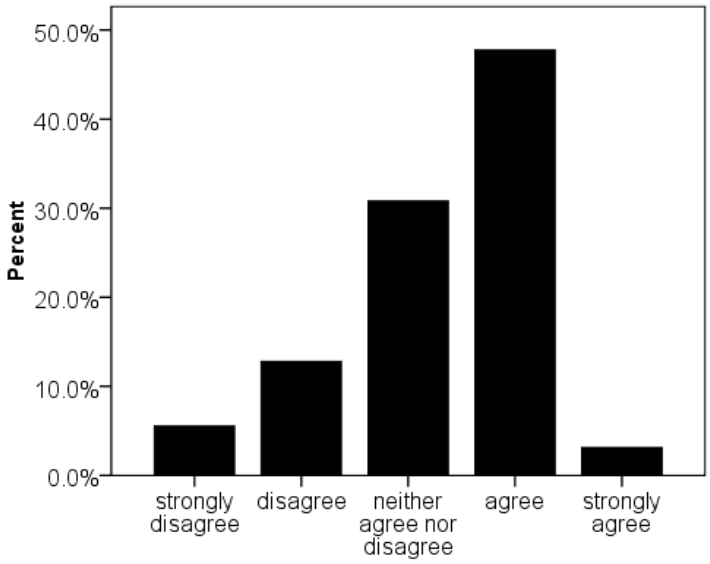

Figure 37 - Answers to the statement 'the co-operative will give locals the chance to benefit from the revenue of the wind farm'

When residents were asked if the co-operative will create a permanent divide in the community between those who join and those who oppose, 38.5% neither agreed nor

[37] The statement varied across co-op and non co-op scheme sites. In the co-op scheme sites the statement is the one indicated above while the statement for the commercial scheme sites was 'the co-operative would just be a ploy to buy residents' consensus'.

disagreed while the combined share of those agreeing or strongly agreeing was 42.5% (figure 38).

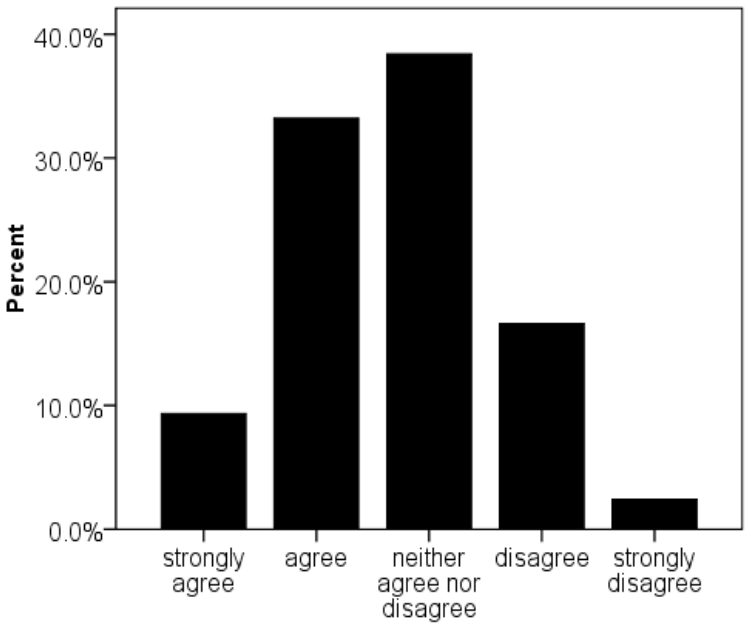

Figure 38 - Answers to the statement 'The co-operative will create a permanent divide in the local community between those who would join and those who would oppose the wind farm'

Respondents largely neither agreed nor disagreed with the statement that 'the co-operative will persuade those who are undecided to support the wind farm', 44%; with the exception for these respondents, the remaining showed a slight prevalence of those that either disagreed or strongly disagreed, who made up to 30% of respondents as opposed to 26% of those who answered 'agree' or strongly agree' (figure 39).

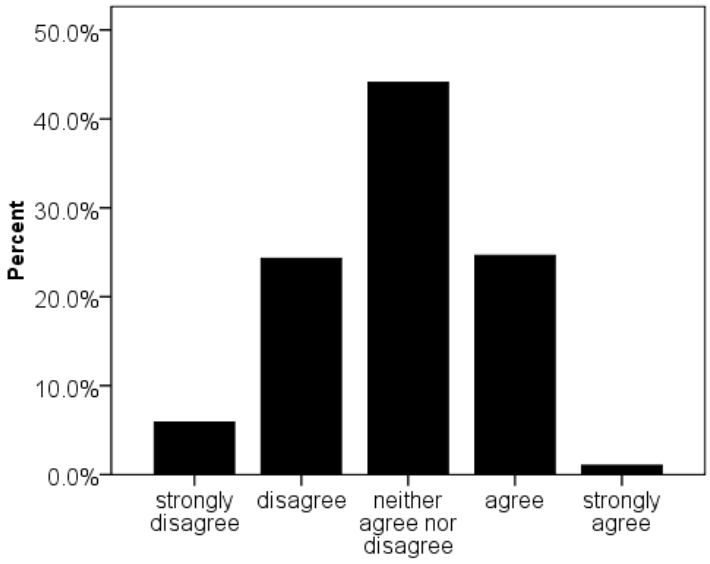

Figure 39 - Answers to the statement 'the co-operative will persuade those who are undecided to support the wind farm'

When asked about the statement affirming that the co-operative would offer the worst compensation for those that don't join in, 41.5% were neither agreeing nor disagreeing with the statement but 38% agreed or strongly agreed (figure 40).

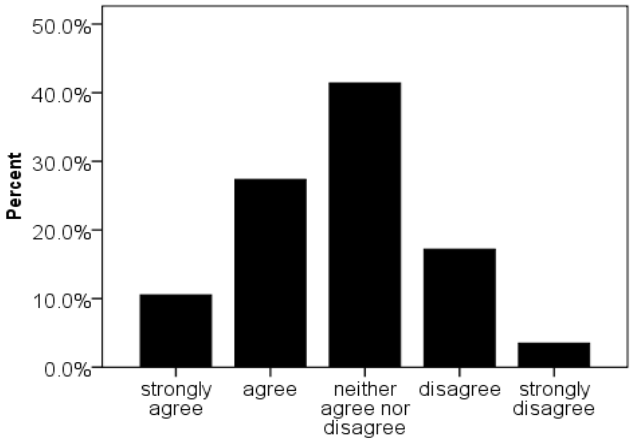

Figure 40 - Answers to the statement 'the co-operative will offer the worst compensation for those who oppose the wind farm because their decision not to join means they will not receive any revenue'

Respondents were asked if they agreed with the statement affirming that the wind farm would involve local people not only financially but also in its management, therefore creating a stable network of local residents who might support further community activities and projects. 36% agreed with the statement and 5% strongly agreed. 34.5% neither agreed nor disagreed (figure 41).

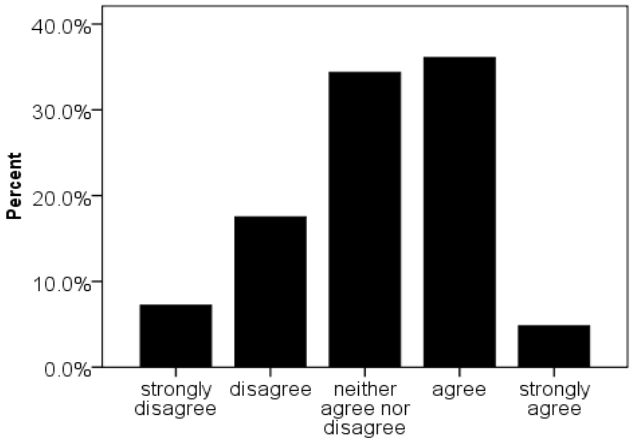

Figure 41 - Answers to the statement 'the co-operative will involve local people not only financially but also in its management: it will create a stable network of local residents who might support further community activities and projects'

The statement ‘the co-operative will persuade even opponents of the wind farm to accept the development’ obtained 39% of ‘neither agree nor disagree’ answers and 43.5% of ‘disagree’ or ‘strongly disagree’ (figure 42).

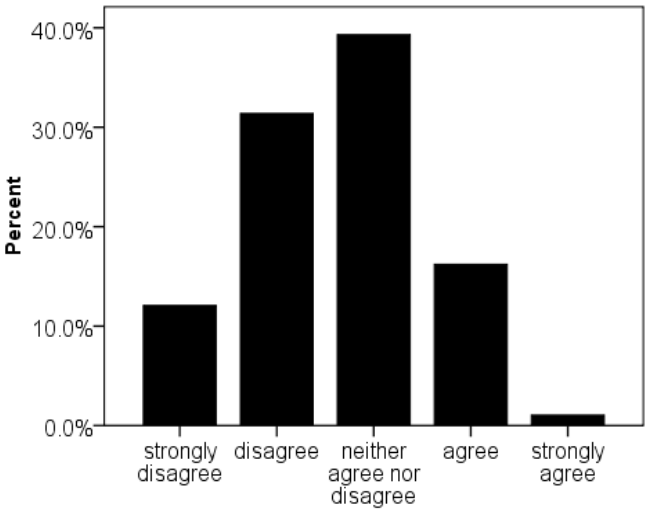

Figure 42 - Answers to the statement ‘the co-operative will persuade even opponents of the wind farm to accept the development’

When confronted with the statement maintaining that the co-operative won’t make any difference in terms of support, 54% of respondents agreed and 11.5% strongly agreed (figure 43).

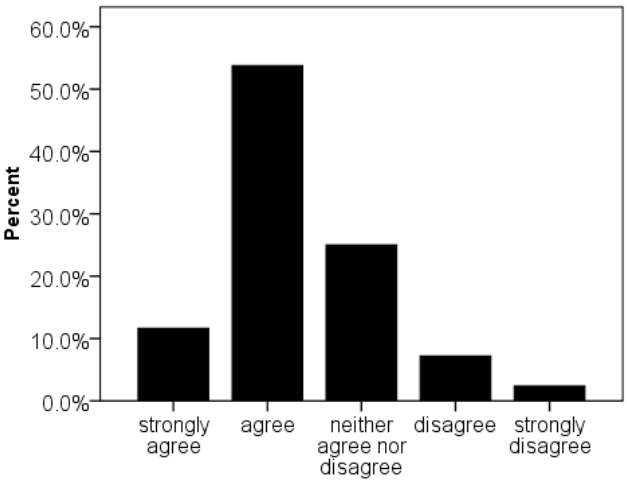

Figure 43 - Answers to the statement ‘the co-operative will not make any difference. People will support or oppose the wind farm regardless of whether there is a co-operative scheme or not’

Respondents were then asked if they would invest in a co-operative scheme given that the price of a single share was £250, 55% answered no while 45% answered yes. Nevertheless, the missing answers were relatively high, 13.3%, therefore if we consider them alongside the ‘yes’ and ‘no’ these become respectively 47% and 39%.

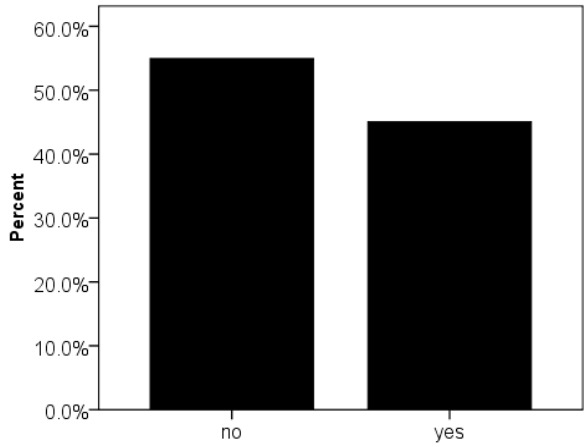

Figure 44 - Answers to the question 'Would you invest in the 'community wind farm co-operative', if the minimum requested investment was £250?'

Respondents were then asked about the reasons for their choice of investing or not question.

The statement 'I think that it would be a good investment opportunity' obtained a 36% of 'agree' answers and 3.5% 'strongly agree' while the 'neither agree nor disagree' were 33.5% (figure 45).

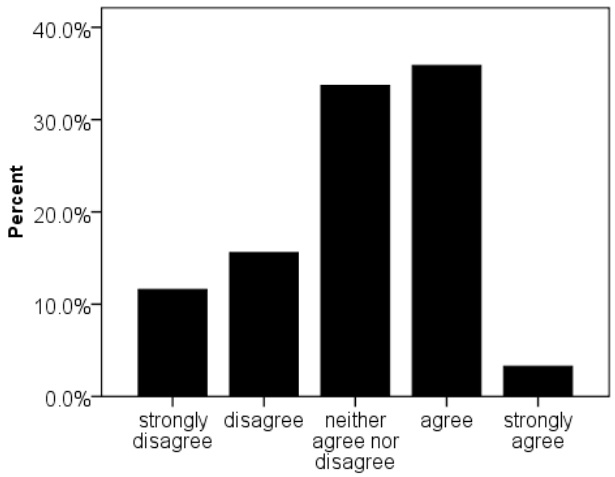

Figure 45 - Answer to the statement 'I think that it would be a good investment opportunity'

37.5% disagreed and 19% strongly disagreed with the statement 'I oppose the wind farm so I would never join in' (figure 46).

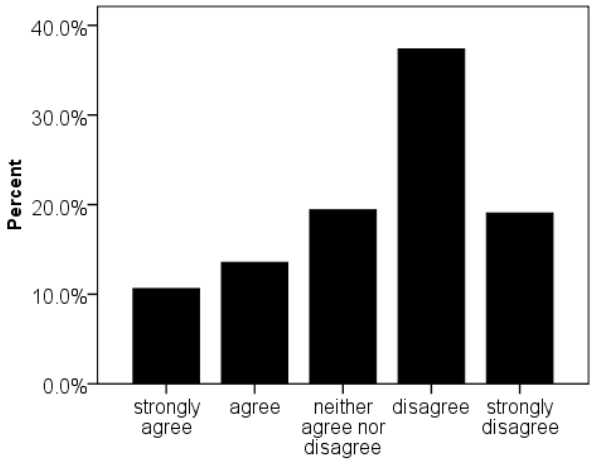

Figure 46 - Answers to the statement 'I oppose the wind farm so I would never join in'

46% of respondents agreed or strongly agreed with the statement 'I believe that we all should do something to fight climate change, therefore I would join' (figure 47), showing that environmental global concern might be on the leading reason to join.

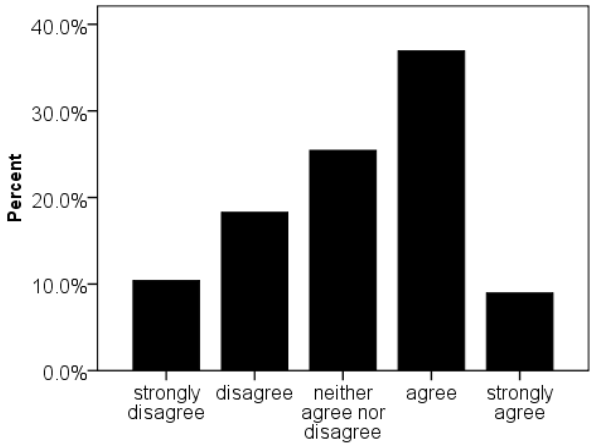

Figure 47 - Answers to the statement 'I believe that we all should do something to fight climate change, therefore I would join'

When asked about the statement 'I couldn't afford to buy the shares', 39% disagreed and 11% strongly disagreed (figure 48).

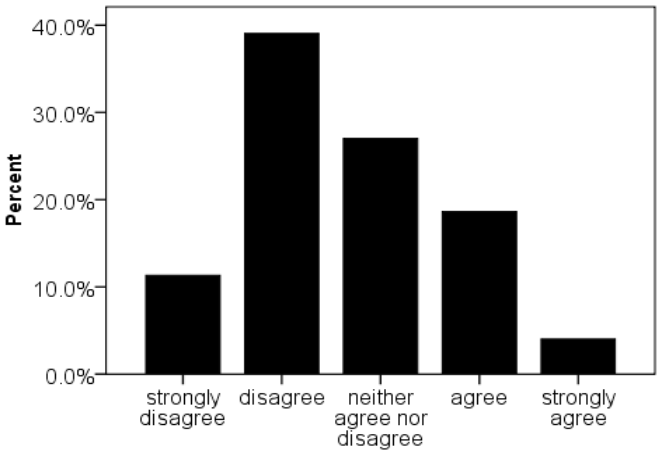

Figure 48 - Answers to the statement 'I couldn't afford to buy shares'

Residents were asked if they agreed or disagreed with the statement 'If people around me, in my community, would support it, so would I'. 36.5% of respondents neither agreed nor disagreed but 47.5% disagreed or strongly disagreed (figure 48).

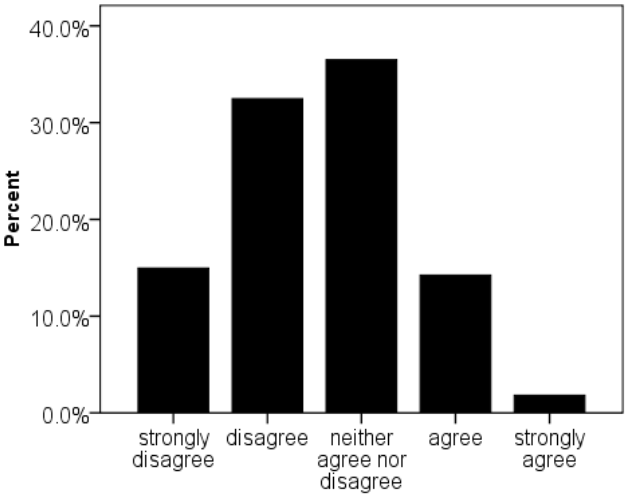

Figure 49 - Answers to the statement 'If people around me, in my community, would support it, so would I'

The statement 'I don't care about the wind farm and so I would not care about the co-operative' returned a 45.5% of 'disagree' and a 16.5% of 'strongly disagree' (figure 50).

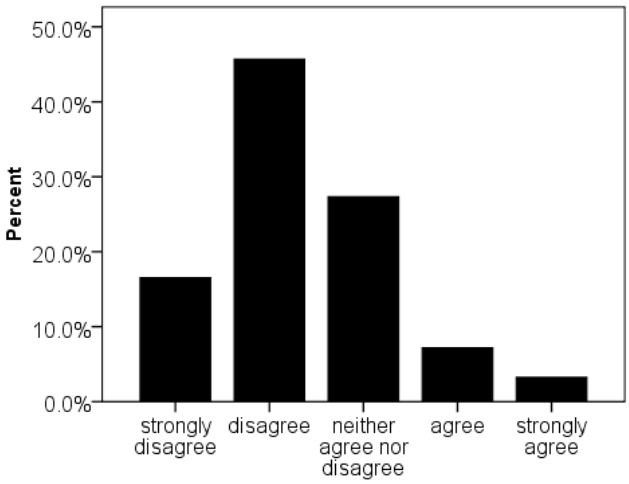

Figure 50 - Answers to the statement 'I don't care about the wind farm and so I would not care about the co-operative'

Respondents answered the statement 'I would be able to have a say in the development of the wind farm and its management' with 36.5% of 'neither agree nor disagree' and 37.5% of 'agree' and 'strongly agree' (figure 51).

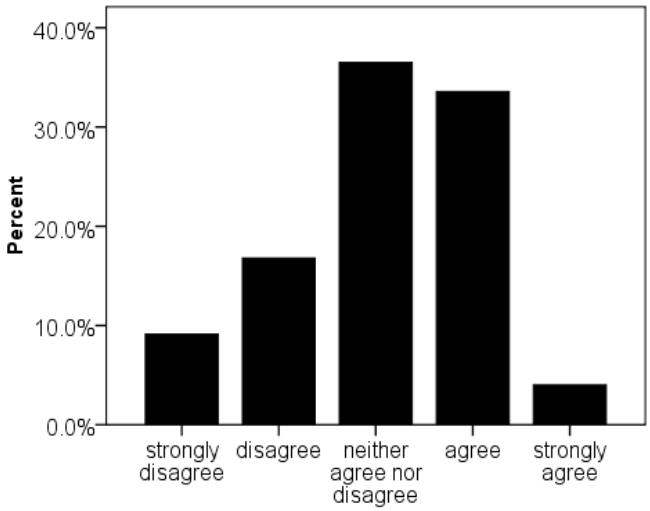

Figure 51 - Answers to the statement 'I would be able to have a say in the development of the wind farm and its management'

Respondents were eventually asked: 'All in all, what do you think of a 'community wind farm co-operative'?' 41.5% answered 'it is a good idea' while and 10.5% answered 'it is an excellent idea' (figure 52).

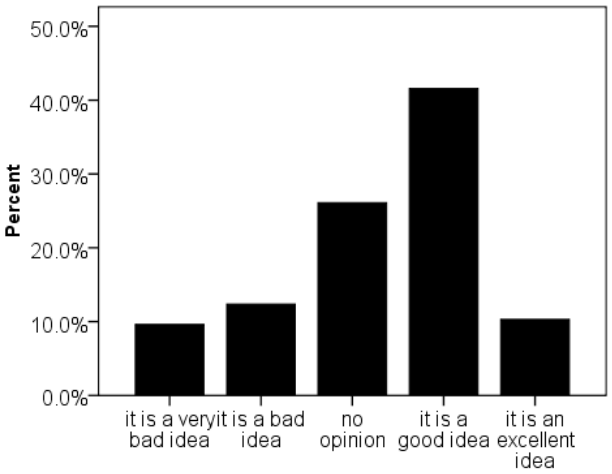

Figure 52 - Answers to the question 'All in all, what do you think of a 'community wind farm co-operative'?'

Respondents were asked their preference between a co-operative scheme and a community fund scheme, 38.5% expressed a preference for the co-operative scheme while 36% answered 'no preference' and 26% answered 'community fund' (figure 53).

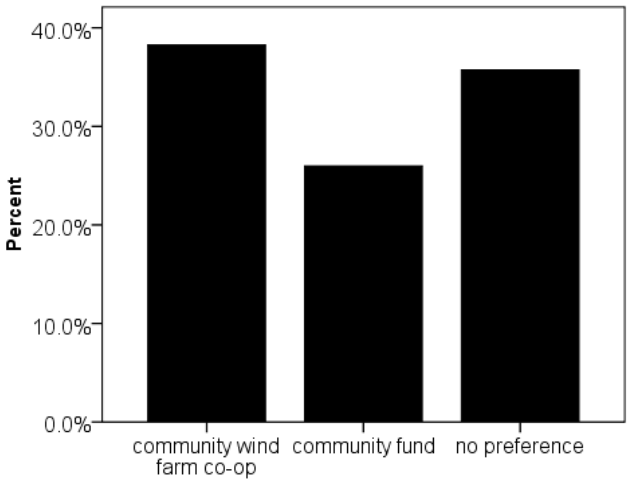

Figure 53 - Answers to the question 'If you could choose ONE of the schemes that we have presented for your local wind farm, which one would you choose?'

4.5 Bivariate correlations

4.5.1 Statistical tests used to assess correlations

As Bryman and Cramer (2009) point out, bivariate correlations should be assessed with different methods in relation to the type of variables analysed.

In all the tests run using SPSS, one of the two variables involved is the item named 'opinionwf' in the SPSS environment. This item, (question n.7 in appendix A),

corresponds to the question on page two of the questionnaire administered asking: “What do you think of the presence of this wind farm in your area?” and providing a multiple choice answer in the form of a five point Likert scale, ranging from ‘strongly disagree’ to ‘strongly agree’. Such variable, despite being treated by some researchers as ‘interval’, is more accurately defined as ‘ordinal’, because it’s not possible to be certain that the respondents would perceive the difference between say ‘strongly agree’ and ‘agree’ as equal to the one between ‘agree’ and ‘neither agree nor disagree’ (Bryman and Cramer, 2009, Field, 2009).

The implications of ‘opinionwf’ being ordinal are that parametric tests are ruled out, even though the matter is not agreed between scholars and some argue in favour of using parametric tests nonetheless (Bryman and Cramer, 2009, Field, 2009). In this case it was chosen to use non-parametric tests, thereby following the mainstream stance that parametric tests can only be used if certain assumptions are met, including, as indicated earlier the data being measured through interval variables (Field, 2009).

As suggested by Bryman and Cramer (2009), it was chosen to carry out different tests depending on the types of variables involved, therefore if one of the variables was nominal, the test used was a cross tabulation associated to a chi-square test and a Cramer’s V test to assess significance and strength of the relationship. If the two variables were ordinal, the test used was Kendall’s tau. Kendall’s tau appears to be a more solid test than the alternative option Spearman’s rho and possibly more accurate, particularly in small data sets with a large number of tied ranks (Field, 2009).

In order to provide the reader with a complete view of results independently from their significance, they are all reported.

The order of the tests is the same of the order of the items used to measure the variables in the questionnaire.

4.5.2 Personal resources and demographic variables

In this section the tests of correlation regarding the variables pertaining to the group presented in section 1.5.4, which were included in the questionnaire, are presented.

Location

Tables 21-23 show there is a significant relationship at the 0.05 level, i.e. p>0.5 which means that there is less than 5% probability that the relationship has arisen by chance. Nevertheless 5% of cells have an expected count that is less than five and less than the minimum expected count of 4.13, therefore the test should be replicated after collecting more data to confirm the association (Field, 2009). Anyway, the relationship doesn't say anything about the reason of the association, being of course meaningless that the name would influence support or opposition, therefore the explanation must be found in an intervening variable which would possibly explain the difference. The relationship is anyway very weak as the Cramer's V coefficient, which ranges always between 0 and 1, shows.

			Name of the wind farm				
			Cushnie	Nigg Hill	Meikle C	Bracco	Total
Opinion about the locally proposed wind farm	strongly disagree	Count	23	23	13	3	62
		% within opinion about the locally proposed wind farm	37.1%	37.1%	21.0%	4.8%	100.0%
		% within Name of the wind farm	20.5%	28.0%	17.8%	7.3%	20.1%
	disagree	Count	16	5	7	3	31
		% within opinion about the locally proposed wind farm	51.6%	16.1%	22.6%	9.7%	100.0%
		% within Name of the wind farm	14.3%	6.1%	9.6%	7.3%	10.1%
	neither agree nor disagree	Count	22	19	23	19	83
		% within opinion about the locally proposed wind farm	26.5%	22.9%	27.7%	22.9%	100.0%
		% within Name of the wind farm	19.6%	23.2%	31.5%	46.3%	26.9%
	agree	Count	33	21	24	9	87
		% within opinion about the locally proposed wind farm	37.9%	24.1%	27.6%	10.3%	100.0%
		% within Name of the wind farm	29.5%	25.6%	32.9%	22.0%	28.2%
	strongly agree	Count	18	14	6	7	45
		% within opinion about the locally proposed wind farm	40.0%	31.1%	13.3%	15.6%	100.0%
		% within Name of the wind farm	16.1%	17.1%	8.2%	17.1%	14.6%
Total		Count	112	82	73	41	308
		% within opinion about the locally proposed wind farm	36.4%	26.6%	23.7%	13.3%	100.0%
		% within Name of the wind farm	100.0%	100.0%	100.0%	100.0%	100.0%

*Table 21 - opinion about the locally proposed wind farm * Name of the wind farm Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.734[a]	12	.030
Likelihood Ratio	23.149	12	.026
Linear-by-Linear Association	.720	1	.396
N of Valid Cases	308		

a. 1 cell (5.0%) has expected count less than 5. The minimum expected count is 4.13.

Table 22 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.272	.030
	Cramer's V	.157	.030
N of Valid Cases		308	

Table 23 - Symmetric Measures

Opinion about the wind farm and distance of respondents

Testing for a correlation between the distances of respondents, i.e. living in the 0-5 km band vs those in the 5-10 km, and opinion of the proposed wind farm, it was found contrarily to expectations that there is no significant relationship (table 24).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Residents' distance from the proposed site*	Correlation Coefficient	.057
		Sig. (1-tailed)	.134
		N	308

Table 24 – Correlations between 'residents' distance from the proposed site' and 'opinion about the locally proposed wind farm'

Deprivation Vs Affluence

It was looked at the relationship between the social context of deprivation /affluence and opinion about the proposed wind farm, a significant relationship could not be found when the proposed sites were simply divided into deprived and not deprived (table 25).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Social context deprived/affluent*	Correlation Coefficient	.012
		Sig. (1-tailed)	.407
		N	308

Table 25 - Correlations between 'opinion about the proposed wind farm' and 'social context deprived/affluent'

To check again on the relationship, another deprivation variable was created, called 'socialcontext2', recoding the wind farm name variable and placing in order the values (names) in correspondence with the average SIMD for the area surveyed from 1, the least deprived (i.e. Meikle Carewe) to 4 the most deprived (i.e. Bracco). The result again didn't show any significant relationship (table 26).

			Socialcontext2
Kendall's tau_b	*opinion about the locally proposed wind farm*	Correlation Coefficient	.026
		Sig. (1-tailed)	.295
		N	308

Table 26 – Correlations between 'opinion about the proposed wind farm' and 'socialcontext2'

It was then looked at the relationship between deprivation and having an opinion about the wind farm, i.e. the presence of an opinion, generating a cross tabulation an its relative chi-square and Cramer's V between the deprivation variable 'socialcontext2', earlier described, and a new variable called 'presence of opinion', obtained by recoding the variable of opinion about the wind farm. The recoding process entailed generating a dichotomous variable with scores 1, opinion, and 2, no opinion, obtained from the 5 point Likert scale values of the original variable (strongly disagree…etc.). In this case it was possible to find a significant correlation at the 0.01 level, $p>0.01$, albeit of modest strength (tables 27 -29).

			Socialcontext2				
			1.00	2.00	3.00	4.00	Total
Presence of opinion	*Opinion*	Count	50	90	63	22	225
		% within presence of opinion	22.2%	40.0%	28.0%	9.8%	100.0%
		% within socialcontext2	68.5%	80.4%	76.8%	53.7%	73.1%
	No opinion	Count	23	22	19	19	83
		% within presence of opinion	27.7%	26.5%	22.9%	22.9%	100.0%
		% within socialcontext2	31.5%	19.6%	23.2%	46.3%	26.9%
Total		Count	73	112	82	41	308
		% within presence of opinion	23.7%	36.4%	26.6%	13.3%	100.0%

*Table 27 - presence of opinion * socialcontext2 Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.234[a]	3	.007
Likelihood Ratio	11.628	3	.009
Linear-by-Linear Association	1.557	1	.212
N of Valid Cases	308		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.05.

Table 28 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.199	.007
	Cramer's V	.199	.007
N of Valid Cases		308	

Table 29 - Symmetric Measures

Level of education

It was then tested for the correlation between the level of education attained by respondents and the opinion about the wind farm and no significant relationship was found (table 30).

			opinion about the locally proposed wind farm
Kendall's tau_b	*Level of education*	Correlation Coefficient	-.075
		Sig. (1-tailed)	.061
		N	297

Table 30 - Correlations between 'opinion about the proposed wind farm' and 'level of education'

Number of household members

Looking at the relationship between the number of components of the family and opinion about the proposed wind farm, it was found a significant weak correlation, meaning that larger households were slightly more supportive (table 31).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Number of household members*	Correlation Coefficient	.114*
		Sig. (1-tailed)	.013
		N	263

Table 31 - Correlations between 'opinion about the proposed wind farm' and 'number of household members'

Income

No significant correlation was found between household income and the opinion about the proposed wind farm (table 32).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Household income*	Correlation Coefficient	-.067
		Sig. (1-tailed)	.084
		N	271

Table 32 - Correlations between 'opinion about the proposed wind farm' and 'household income'

When it was checked the correlation between income per family member and opinion about the proposed wind farm, it was found a weak negative correlation significant at the 0.05 level. This means that in the sample, those with a higher income per family member were less consensual about the proposed wind far (table 33).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Estimation of income per family member*	Correlation Coefficient	-.111*
		Sig. (1-tailed)	.014
		N	233

Table 33 - Correlations between 'opinion about the proposed wind farm' and 'estimation of income per family member'

Knowledge about wind energy

A range of questions were included to assess respondents' knowledge about wind energy and regarding: comparable pollution caused by wind energy production (wind vs coal), comparable cost of wind energy (wind vs coal), intermittency of wind generation from a single generator and classification of wind energy as a renewable energy source (questions from 4.1 to 4.4 in appendix A).

The rationale, as earlier explained, was to assess how knowledge influenced levels of consent regarding a locally proposed wind farm.

Therefore, these variable were computed to create an index, named ‘knowwind’, which was built for any respondent who had answered at least three questions out of four, following the procedure described by Bryman and Cramer (2009).

It was then generated a correlation test between this index and the opinion regarding the wind farm, which returned a result on the border of the significance level (table 34).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Knowwind*	Correlation Coefficient	-.078
		Sig. (1-tailed)	.051
		N	303

Table 34 - Correlations between ‘opinion about the proposed wind farm’ and ‘Knowind’

Repeating the Kendall’s tau test after recoding the variable regarding the opinion about the wind farm could return a significant result. In fact the formula for calculating Kendall’s tau appears as follows (Nelsen):

$$\tau = \frac{(\text{number of concordant pairs}) - (\text{number of discordant pairs})}{\frac{1}{2}n(n-1)}.$$

Therefore it is possible to assume that increasing the number of concordant pairs and reducing that of discordant pairs will eventually increase the value of tau statistic and its significance.

This could be done recoding the 5-point Likert scale answers of the item regarding the opinion about the proposed wind farm, named ‘opinionwf’, in a 3-point scale (disagree, don’t know, agree), named ‘opinionwf3items’. Testing again for a correlation, the coefficient was found to be larger and significant at the 0.05 level (table 35), therefore showing that the higher is the knowledge, the less respondents agree with the proposed wind farm.

			Opinionwf3items
Kendall's tau_b	*Knowwind*	Correlation Coefficient	-.096*
		Sig. (1-tailed)	.028
		N	303

Table 35 - Correlations between ‘opinionwf3items’ and ‘Knowwind’

Awareness about the proposed wind farm

Looking at the correlation between awareness of the proposed wind farm and opinion about the wind farm, it was found a significant correlation which presents a Cramer's V value of 0.35 (tables 36 -38).

			Awareness of the proposed wind farm		
			No	Yes	Total
Opinion about the locally proposed wind farm	strongly disagree	Count	7	54	61
		% within opinion about the locally proposed wind farm	11.5%	88.5%	100.0%
		% within awareness of the proposed wind farm	7.1%	26.0%	19.9%
	disagree	Count	9	22	31
		% within opinion about the locally proposed wind farm	29.0%	71.0%	100.0%
		% within awareness of the proposed wind farm	9.2%	10.6%	10.1%
	neither agree nor disagree	Count	47	36	83
		% within opinion about the locally proposed wind farm	56.6%	43.4%	100.0%
		% within awareness of the proposed wind farm	48.0%	17.3%	27.1%
	agree	Count	26	60	86
		% within opinion about the locally proposed wind farm	30.2%	69.8%	100.0%
		% within awareness of the proposed wind farm	26.5%	28.8%	28.1%
	strongly agree	Count	9	36	45
		% within opinion about the locally proposed wind farm	20.0%	80.0%	100.0%
		% within awareness of the proposed wind farm	9.2%	17.3%	14.7%
Total		Count	98	208	306
		% within opinion about the locally proposed wind farm	32.0%	68.0%	100.0%

*Table 36 - opinion about the locally proposed wind farm * awareness of the proposed wind farm Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.152[a]	4	.000
Likelihood Ratio	38.898	4	.000
Linear-by-Linear Association	1.578	1	.209
N of Valid Cases	306		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.93.

Table 37 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.353	.000
	Cramer's V	.353	.000
N of Valid Cases		306	

Table 38 - Symmetric Measures

Seeing the proposed windfarm site from home

Significant was also the correlation between seeing the wind farm proposed site from home and the opinion about the wind farm. Here to limit the size of the cross tabulation the variable 'opinionwf3items' was used instead of the 'opinionwf' (tables 39 -41).

			Seeing the wind farm site from home			
			No	Yes	I don't know where is	Total
Opinionwf3items	disagree+strongly disagree	Count	34	48	11	93
		% within opinionwf3items	36.6%	51.6%	11.8%	100.0%
		% within seeing the wind farm site from home	24.1%	51.1%	15.1%	30.2%
	neither agree nor disagree	Count	34	13	36	83
		% within opinionwf3items	41.0%	15.7%	43.4%	100.0%
		% within seeing the wind farm site from home	24.1%	13.8%	49.3%	26.9%
	agree+strongly agree	Count	73	33	26	132
		% within opinionwf3items	55.3%	25.0%	19.7%	100.0%
		% within seeing the wind farm site from home	51.8%	35.1%	35.6%	42.9%
Total		Count	141	94	73	308
		% within opinionwf3items	45.8%	30.5%	23.7%	100.0%

*Table 39 - opinionwf3items * seeing the wind farm site from home Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.618[a]	4	.000
Likelihood Ratio	43.268	4	.000
Linear-by-Linear Association	1.660	1	.198
N of Valid Cases	308		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.67.

Table 40 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.385	.000
	Cramer's V	.272	.000
N of Valid Cases		308	

Table 41 - Symmetric Measures

Frequency of view of the proposed site

It was then checked the correlation between how often respondents see the proposed site, in case they couldn't see it from home, and the opinion about the proposed wind farm. The relationship was negative, which means that those who answered 'never' or 'rarely' were more likely to support the wind farm. Nevertheless the significance level was not achieved (table 42), if not when the correlation was tested again using the reduced variable of the opinion about the wind farm, 'opinionwf3items' (table 43).

		opinion about the locally proposed wind farm
Kendall's tau_b	Correlation Coefficient	-.093
How often see the wind farm site	Sig. (1-tailed)	.091
	N	140

Table 42 – Correlations between 'opinion about the proposed wind farm' and 'how often see the wind farm site'

			Opinionwf3items
Kendall's tau_b	*How often see the wind farm site*	Correlation Coefficient	-.123*
		Sig. (1-tailed)	.047
		N	140

Table 43 - Correlations between 'opinionwf3items' and 'how often see the wind farm site'

Awareness of the presence of a community scheme

The following item in this section regards the awareness that respondents had of the presence of a community scheme. The vast majority of respondents were not aware as earlier shown (see relative frequency table in section 4.4.1).

The variable is nominal and therefore looking for a correlation with opinion about the wind farm entailed generating a crosstabulation and calculating the Chi-square, but this statistic requires the presence of a minimum number of cases within the crosstabulation, which couldn't be met without collapsing both variables. So in the case of opinion about the wind farm it was used the 'opinionwf3items' variable, earlier introduced which transforms the original variable from a 5-point Likert scale into a 3 point-scale. While in the case of the nominal variable about the awareness of the schemes this was repeatedly collapsed until the crosstabulation resulted in a table bearing no zeros in any box. This was achieved only when the variable named 'awarescheme3' was ultimately reduced to a dichotomous variable bearing two answer modes: 'any community scheme' and 'not aware of any' (table 44).

The correlation is significant at the 0.01 level although the Cramer's V coefficient of 0.219 suggests a weak correlation (tables 45 and 46).

			Awarescheme3		
			any community scheme	not aware of any	Total
Opinionwf3items	disagree+strongly disagree	Count	21	70	91
		% within opinionwf3items	23.1%	76.9%	100.0%
		% within awarescheme3	53.8%	26.8%	30.3%
	neither agree nor disagree	Count	3	77	80
		% within opinionwf3items	3.8%	96.3%	100.0%
		% within awarescheme3	7.7%	29.5%	26.7%
	agree+strongly agree	Count	15	114	129
		% within opinionwf3items	11.6%	88.4%	100.0%
		% within awarescheme3	38.5%	43.7%	43.0%
Total		Count	39	261	300
		% within opinionwf3items	13.0%	87.0%	100.0%

*Table 44 - opinionwf3items * awarescheme3 Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.437[a]	2	.001
Likelihood Ratio	15.191	2	.001
Linear-by-Linear Association	4.901	1	.027
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.40.

Table 45 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.219	.001
	Cramer's V	.219	.001
N of Valid Cases		300	

Table 46 - Symmetric measures

4.5.3 Attitudinal factors

In this section the correlations concerning the attitudinal factors whose frequencies were presented in section 4.4.3 are presented.

Local benefits and costs

Testing the relationship between the amount of local advantages and disadvantages perceived to be related with the proposed wind farm and the opinion about the wind farm the significance level of 0.01 was achieved (table 47). Hence, subjects, who found that mostly disadvantages were to be expected by the wind farm development, disagreed the most with the project.

		Opinion about the locally proposed wind farm
Kendall's tau_b	Correlation Coefficient	.684**
Local benefits/disadvantages	Sig. (1-tailed)	.000
	N	298

Table 47 - Correlations between 'opinion about the wind farm' and 'local benefits/disadvantages'

Health of the local community

Looking more in detail at the specific range of advantages and disadvantages surveyed, it is possible to see that when individuals hold the belief that the wind farm will harm the health of the local community they will be likely to oppose the development. The relationship is significant at the 0.01 level (table 48).

		Opinion about the locally proposed wind farm
Kendall's tau_b *WF harms local health*	Correlation Coefficient	.571**
	Sig. (1-tailed)	.000
	N	292

Table 48 - Correlations between 'opinion about the wind farm' and 'WF harms local health'

Climate change impact

The same level of significance p>0.01 was found when the belief that wind farm helps against climate change was tested in relation with opinion about the wind farm (table 49). Respondents who held the belief that the wind farm helps against climate change appeared more supportive of the project.

			WF helps climate change
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.501**
		Sig. (1-tailed)	.000
		N	300

Table 49 - Correlations between 'opinion about the wind farm' and 'WF helps climate change'

Visual impact

A significant correlation at the 0.01 level was found also between believing that the wind farm looks bad on the landscape and opposing the wind farm, showing that respondents foreseeing a negative visual impact were more likely to have a negative opinion about the wind farm (table 50).

			WF looks bad on the landscape
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.654**
		Sig. (1-tailed)	.000
		N	295

Table 50 - Correlations between 'opinion about the wind farm' and 'WF looks bad on the landscape'

Impact on the local economy

When the correlation between the belief that the wind farm improves the locally economy was tested with the opinion about the wind farm, a positive correlation was found at the significance level of 0.01, meaning that who held the belief was more supportive of the wind farm (table 51).

			WF improves the local economy
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.567**
		Sig. (1-tailed)	.000
		N	290

Table 51 - Correlations between 'opinion about the wind farm' and 'WF improves the local economy'

Impact on property prices

Respondents who thought that the wind farm would bring down local property prices were more likely to oppose the wind farm. The correlation held at a significance level of 0.01 (table 52).

			WF bring down property prices
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.526**
		Sig. (1-tailed)	.000
		N	295

Table 52 – Correlations between 'opinion about the wind farm' and 'WF bring down property prices'

Impact on local tourism

Subjects who disagreed with the statement that the wind farm would attract tourists were more likely to oppose the development. This is shown by a correlation significant at the 0.01 level (table 53).

			WF attract tourists
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.505**
		Sig. (1-tailed)	.000
		N	294

Table 53 – Correlations between 'opinion about the locally proposed wind farm' and 'WF attracts tourists'

Noise impact

The belief that the wind farm would be noisy was also significantly correlated with opposition to the wind farm at the 0.01 level (table 54).

			WF is noisy
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.537**
		Sig. (1-tailed)	.000
		N	295

Table 54 – Correlations between 'opinion about the locally proposed wind farm' and 'WF is noisy'

Cost of electricity

A significant positive correlation, at the 0.01 level, was also found between the belief that the wind farm will produce costlier electricity and opposition towards the proposed development (table 55).

			WF generates costlier electricity
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.385**
		Sig. (1-tailed)	.000
		N	298

Table 55 - Correlations between 'opinion about the locally proposed wind farm' and 'WF generates costlier electricity'

Dependency on foreign fuels

A positive correlation significant at the 0.01 level was found between the belief that the wind farm will help to tackle the problem of fuel dependency and support towards the project (table 56).

			WF helps with fuel dependency
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.532**
		Sig. (1-tailed)	.000
		N	300

Table 56 - Correlations between 'opinion about the locally proposed wind farm' and 'WF helps with fuel dependency'

The 'benefitscostsvalue' scale

It was built then a new variable computing all the scores which respondents gave to single benefits and costs, or advantages and disadvantages that they were asked about, whose correlations with the opinion on the wind farm have been earlier presented. The variables used were 9 and ranged from the effects on health to the effects on fuel dependency. The new variable was called 'benefitscostsvalue' because it reflects the value that each respondent gave on all the specific costs and benefits of the wind farm surveyed.

Once this new variable was tested in relation with the opinion about the wind farm, it was found a significant correlation at the 0.01 level with an 'high' coefficient, by the standards indicated by Bryman and Cramer (2009) (table 57).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Benefitscostsvalue*	Correlation Coefficient	.731**
		Sig. (1-tailed)	.000
		N	291

Table 57 - Correlations between 'opinion about the locally proposed wind farm' and 'benefitscostsvalue'

A hypothesis was made in earlier chapters that personal resources such as education, income and knowledge could influence the perception of benefits and costs regarding the proposed development and more in general about any considered course of pro-environmental action.

In order to assess this hypothesis was then tested the correlation between the variable 'benefitscostsvalue' with the 'knowwind value'. The relationship proved to be significant at the 0.05 but very weak and negative i.e. the people that scored higher on knowledge about wind energy tended to see less benefits from the project (table 58).

			Knowwind
Kendall's tau_b	*Benefitscostsvalue*	Correlation Coefficient	-.078*
		Sig. (1-tailed)	.044
		N	289

Table 58 - Correlations between 'benefitscostsvalue' and 'Knowwind'

Following the same rationale it was tested the relationship between 'benefitscostsvalue' and the estimation of annual income per family member. The correlations is significant at the 0.05 level but with a very low negative coefficient, meaning that higher income per person households tended to see more the disadvantages of the project (table 59).

			Benefitscostsvalue
Kendall's tau_b	*Estimation of income per family member*	Correlation Coefficient	-.090*
		Sig. (1-tailed)	.028
		N	226

Table 59 - Correlations between 'benefitscostsvalue' and 'estimation of income per family member'

Eventually education was tested with 'benefitscostsvalue' but no significant correlation was found (table 60).

			Level of education
Kendall's tau_b	*Benefitscostsvalue*	Correlation Coefficient	-.064
		Sig. (1-tailed)	.079
		N	283

Table 60 - Correlations between 'benefitscostsvalue' and 'level of education'

Environmental citizenship

Some items, (n. 18 -18.3, Appendix A), were looking at the concept of 'environmental citizenship' i.e. the perception that respondents might have had of a sense of responsibility towards either the global, the national, the local environment or neither of them,

considering instead the government as being the only subject responsible for acting pro-environmentally.

It was tested the correlation of this variable with the opinion about the wind farm, looking at the chi-square and Cramer's V coefficient but no significant correlation was found (tables 61 -63).

			Environmental citizenship level				
			we all have to do some-thing to protect the global environment	we all have to do some-thing to take care of our country's environment	we all have to do some-thing to protect our local environment	it's a matter for the government not us to take care of the environment	Total
Opinionwf3 items	disagree +strongly disagree	Count	32	7	37	6	82
		% within opinionwf3items	39.0%	8.5%	45.1%	7.3%	100.0%
		% within environmental citizenship level	24.1%	23.3%	33.6%	42.9%	28.6%
	neither agree nor disagree	Count	38	8	29	4	79
		% within opinionwf3items	48.1%	10.1%	36.7%	5.1%	100.0%
		% within environmental citizenship level	28.6%	26.7%	26.4%	28.6%	27.5%
	agree +strongly agree	Count	63	15	44	4	126
		% within opinionwf3items	50.0%	11.9%	34.9%	3.2%	100.0%
		% within environmental citizenship level	47.4%	50.0%	40.0%	28.6%	43.9%
Total		Count	133	30	110	14	287
		% within opinionwf3items	46.3%	10.5%	38.3%	4.9%	100.0%

*Table 61 - opinionwf3items * environmental citizenship level Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.093[a]	6	.532
Likelihood Ratio	5.077	6	.534
Linear-by-Linear Association	3.934	1	.047
N of Valid Cases	287		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 3.85.

Table 62 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.133	.532
	Cramer's V	.094	.532
N of Valid Cases		287	

Table 63 - Symmetric Measures

Pro-environmental attitudes vs pro-economy attitudes

It was tested the correlation between the opinion about the wind farm and the variable attempting to gauge the pro-environmental attitudes of respondents, asking them to answer choosing within four modes based on a trade-off between environmental protection and economic growth (items 19 -19.3 in Appendix A). This variable appears to have a significant correlation at the 0.01 level with the opinion regarding the wind farm, but presents a very low coefficient (table 64).

			Environment vs economy trade-off
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.157**
		Sig. (1-tailed)	.001
		N	294

Table 64 - Correlations between 'opinion about the locally proposed wind farm' and 'environment vs economy trade-off'

Place attachment

The last two items of the questionnaire (20 and 20.1, in Appendix A) were assessing the attachment of respondents to the physical and social places surrounding them. Using the single items of the questionnaire was then created a new scale variable on which respondents ranked from 2, maximum level of attachment, to 10, minimum level of attachment, named 'Place_attachment2'. Hence, it was tested the correlation between this new variable and the opinion about the proposed wind farm. The correlation resulted significant at the 0.01 level, although the coefficient is very low, nevertheless it suggests that respondents who showed a greater level of attachment tend to oppose more the wind farm (table 65).

			Place_attachment2
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	0.192**
		Sig. (1-tailed)	0.000
		N	307

Table 65 - Correlations between 'opinion about the locally proposed wind farm' and 'place_attachment2'

In order to account for any difference in the correlations between the opinion about the wind farm and the perception of attachment to physical and social places, the individual correlations are reported here (tables 66 -67).

			Place attachment-physical place
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	0.201**
		Sig. (2-tailed)	0.000
		N	305

Table 66 – Correlations between 'opinion about the locally proposed wind farm' and 'place attachment – physical place'

			Place attachment-social place
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	0.172**
		Sig. (2-tailed)	0.001
		N	303

Table 67 – Correlations between 'opinion about the locally proposed wind farm' and 'place attachment –social place'

4.5.4 Contextual factors

In this section, the correlations regarding the factors whose frequencies were presented in section 4.4.5 are introduced.

Trust

When the variable 'trust towards the developers' was tested with opinion about the wind farm, it was found a significant correlation at the 0.01 level, which shows that who distrusted the developers was also against the proposed wind farm (table 68).

		Opinion about the locally proposed wind farm
Kendall's tau_b *Trust toward developers*	Correlation Coefficient	.622**
	Sig. (1-tailed)	.000
	N	304

Table 68 – Correlations between 'opinion about the proposed wind farm' and 'trust towards developers'

Information received

Equally significant ate the 0.01 level was found to be the correlation between information provided about the wind farm project and opinion about the wind farm, i.e. the subjects who disagreed the most with having been thoroughly informed tended to be also mostly against the proposed wind farm (table 69).

			Opinion about the locally proposed wind farm
Kendall's tau_b	*Information about the wind farm*	Correlation Coefficient	.300**
		Sig. (1-tailed)	.000
		N	305

Table 69 – Correlations between 'opinion about the wind farm' and 'information about the wind farm'

Commercial vs co-operative scheme

Looking at the correlation between the scheme of ownership, i.e. the wind farm having a commercial or a co-operative scheme, and the opinion about the wind farm, a weak correlation appeared (tables 70 -72). It has to be said though that this finding is of little significance, as we know that only a minority of respondents were aware of the scheme proposed in their area.

			scheme of ownership co-op/commercial		
			co-op scheme	commercial scheme	Total
Opinion about the locally proposed wind farm	strongly disagree	Count	46	16	62
		% within opinion about the locally proposed wind farm	74.2%	25.8%	100.0%
	disagree	Count	21	10	31
		% within opinion about the locally proposed wind farm	67.7%	32.3%	100.0%
	neither agree nor disagree	Count	41	42	83
		% within opinion about the locally proposed wind farm	49.4%	50.6%	100.0%
	agree	Count	54	33	87
		% within opinion about the locally proposed wind farm	62.1%	37.9%	100.0%
	strongly agree	Count	32	13	45
		% within opinion about the locally proposed wind farm	71.1%	28.9%	100.0%
		% within opinion about the locally proposed wind farm	63.0%	37.0%	100.0%

*Table 70 - Opinion about the locally proposed wind farm * scheme of ownership co-op/commercial Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.521[a]	4	.021
Likelihood Ratio	11.524	4	.021
Linear-by-Linear Association	.616	1	.433
N of Valid Cases	308		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.47.

Table 71 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.193	.021
	Cramer's V	.193	.021
N of Valid Cases		308	

Table 72 - Symmetric Measures

The co-operative scheme

The correlation regarding a series of items, whose frequencies have been earlier shown in section 4.4.4, and whose purpose was to measure positive and negative attitudes towards a number of statements regarding the co-operative scheme is here presented. It was built a scale variable, named 'co-opschemeopinion', ranking respondents from the score of 7, only negative opinions about the co-operative scheme, to 36, only positive opinions about the scheme.

It was then tested the correlation between the new variable and opinion about the wind farm, using the Kendall's tau test but, in this case, two-tailed, because it is plausible to think that the direction of the correlation could be both ways. The result shows a significant correlation at the 0.01 level with a positive coefficient (table 73), meaning that respondents judging negatively the proposal of the wind farm equally tended to score negatively about the co-operative scheme.

			Co-opschemeopinion
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.555**
		Sig. (2-tailed)	.000
		N	282

Table 73 – Correlations between 'opinion about the locally proposed wind farm' and 'co-operative scheme opinion'

Investment in the co-operative scheme

The questionnaire asked respondents if they would invest in a local wind farm co-operative at the price of £250 per share. As imaginable answers would differ sensibly depending on respondents supporting or opposing the project. In fact it was found a significant correlation at 0.01 level but the Cramer's V coefficient, which ranges from 0

to 1, in this case is 0.53 showing that some respondents where open to behave incoherently with their statement of support/opposition (tables 74 -76).

			Opinion about the locally proposed wind farm					
			strongly disagree	disagree	neither agree nor disagree	agree	strongly agree	Total
Decision to invest	no	Count	52	21	46	26	5	150
		% within decision to invest	34.7%	14.0%	30.7%	17.3%	3.3%	100.0%
		% within opinion about the locally proposed wind farm	92.9%	75.0%	61.3%	35.6%	12.8%	55.4%
	yes	Count	4	7	29	47	34	121
		% within decision to invest	3.3%	5.8%	24.0%	38.8%	28.1%	100.0%
		% within opinion about the locally proposed wind farm	7.1%	25.0%	38.7%	64.4%	87.2%	44.6%
Total		Count	56	28	75	73	39	271
		% within decision to invest	20.7%	10.3%	27.7%	26.9%	14.4%	100.0%

*Table 74 - decision to invest * opinion about the locally proposed wind farm Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	77.384[a]	4	.000
Likelihood Ratio	87.238	4	.000
Linear-by-Linear Association	75.853	1	.000
N of Valid Cases	271		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.50.

Table 75 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.534	.000
	Cramer's V	.534	.000
N of Valid Cases		271	

Table 76 - Symmetric Measures

A number of statements follow in the questionnaire surveying the motives for the choice of investing. Their scores will be analysed later in section 4.6 using multivariate correlation tests.

Opinion about the co-operative scheme

A question posed was about the overall opinion of the co-operative scheme (n. 16 of the questionnaire in Appendix A). This was likely to relate with the opinion regarding the wind farm, so the correlation was tested with a 2-tailed test, because it is not obvious which one of the two is the dependent variable (table 77). The correlation is significant at 0.01 level and the coefficient is 0.61. This means that who disapproved of the wind farm tended to consider the co-operative scheme a bad idea too.

			Co-operative idea opinion
Kendall's tau_b	*Opinion about the locally proposed wind farm*	Correlation Coefficient	.612**
		Sig. (2-tailed)	.000
		N	287

Table 77 - Correlations between 'opinion about the locally proposed wind farm' and 'co-operative idea opinion'

Preferred scheme: co-operative vs community fund

Respondents were asked about their favourite scheme of choice between the co-operative scheme and a community fund scheme or no preference.

Again it made sense to test this question in relation to the opinion about the wind farm: the correlation resulted significant at the 0.01 level showing that respondents opposing, or neither opposing nor supporting the wind farm, were more likely to express a preference for 'no preference' (tables 78 -80).

			Opinionwf3items			
			disagree +strongly disagree	neither agree nor disagree	agree +strongly agree	Total
Scheme of choice	community wind farm co-op	Count	19	21	65	105
		% within Scheme of choice	18.1%	20.0%	61.9%	100.0%
		% within opinionwf3items	25.7%	26.6%	53.7%	38.3%
	community fund	Count	23	21	27	71
		% within Scheme of choice	32.4%	29.6%	38.0%	100.0%
		% within opinionwf3items	31.1%	26.6%	22.3%	25.9%
	no preference	Count	32	37	29	98
		% within Scheme of choice	32.7%	37.8%	29.6%	100.0%
		% within opinionwf3items	43.2%	46.8%	24.0%	35.8%
Total		Count	74	79	121	274
		% within Scheme of choice	27.0%	28.8%	44.2%	100.0%

*Table 78 - Scheme of choice * opinionwf3items Crosstabulation*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.369[a]	4	.000
Likelihood Ratio	23.578	4	.000
Linear-by-Linear Association	16.451	1	.000
N of Valid Cases	274		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.18.

Table 79 - Chi-Square Tests

		Value	Approx. Sig.
Nominal by Nominal	Phi	.292	.000
	Cramer's V	.207	.000
N of Valid Cases		274	

Table 80 - Symmetric Measures

4.5.5 Summary table of correlations

Table 81 summarises the correlations presented earlier. It shows only significant correlations between the tested independent variables and the variable 'opinion about the locally proposed wind farm'. The variables are ordered by size of the coefficient of correlation starting from top with the greater positive and ending with the greater negative coefficient.

Independent variable	*Correlation coefficient (test performed)*	*Significance*
'benefitscostsvalue'[i]	.731 (Kendall's tau) .855 (Spearman's rho)	.000 .000
local benefits/disadvantages	.684 (Kendall's tau)	.000
WF looks bad on the landscape	.654 (Kendall's tau)	.000
Trust toward developers	.622 (Kendall's tau)	.000
Co-operative idea opinion	.612 (Kendall's tau)	.000
WF harms local health	.571 (Kendall's tau)	.000
WF improves the local economy	.567 (Kendall's tau)	.000
'co-opschemeopinion'	.555 (Kendall's tau)	.000
WF is noisy	.537 (Kendall's tau)	.000
Decision to invest	.534 (Cramer's V)	.000
WF helps with fuel dependency	.532 (Kendall's tau)	.000
WF bring down property prices	.526 (Kendall's tau)	.000
WF attract tourists	.505 (Kendall's tau)	.000
WF helps climate change	.501 (Kendall's tau)	.000
WF generates costlier electricity	.385 (Kendall's tau)	.000
Awareness of the proposed wind farm	.353 (Cramer's V)	.000
Information about the wind farm	.300 (Kendall's tau)	.000
Seeing the wind farm site from home	.272 (Cramer's V)	.000
'awarescheme3'[ii]	.219 (Cramer's V)	.001
Scheme of choice	.207 (Cramer's V)	.000
Scheme of ownership	.193 (Cramer's V)	.021
'place_attachment2'[iii]	.192 (Kendall's tau)	.000
Environment Vs economy trade-off	.157 (Kendall's tau)	.001
Number of household members	.114 (Kendall's tau)	.013
Knowledge of wind energy 'knowwind'	-.078 (Kendall's tau)	.051
Estimation of income per family member	-.111 (Kendall's tau)	.014
How often see the wind farm site[iv]	-.123 (Kendall's tau)	.047

Table 81 – Summary of significant correlations with the variable 'opinion about the locally proposed wind farm'

[i] As mentioned earlier this variable was obtained creating a new variable from the scores of each respondent regarding the nine items in the questionnaire regarding specific perceived costs and benefits of the wind farm.

[ii] Again it was used the 'opinionwf3items' variable and further, in order to execute Cramer's V test correctly it was needed to collapse the original variable of awareness about the proposed scheme in a dichotomous variable

[iii] As earlier explained 'place_attachment2' is a purpose built scale which includes both answers on the physical and social attachment items.

[iv] Tested vs the 'Opinionwf3items' variable, which had collapsed the 5 point Likert scale of the original variable into a 3 point scale.

4.6 Multivariate analysis

In the following sections the analysis continues through the execution of some multivariate tests and particularly ordinal regression and logistic binomial regression. Before looking in detail at the tests, it is worth to specify that a key assumption such as multicollinearity has been tested for each model generating correlations matrixes using again the Kendall's tau statistic, (being all the variables involved ordinal), and these didn't result in any correlation which was considered of such magnitude, 0.8 or more, (Field, 2009, ReStore, 2011a), to cause concern, therefore the matrixes are not presented to the reader along with the model tests.

4.6.1 Factors influencing acceptability of wind farms

From the summary table of correlations (table 81), presented in the previous section, it is possible to proceed selecting some variables which will be used to perform an ordinal regression analysis.

Ordinal regression

'Ordinal regression', as Norušis (2011) presents it, serves the purpose to analyse data, i.e. predictors (independent variables) and the outcome variable (dependent variable), which are of ordinal nature. In fact the researcher can perform a multivariate regression analysis retaining the ordinal information of the variable, i.e. the scores ordered, for example on a Likert scale (like in this case), along a continuum that represents the concept measured. This removes the need of considering the variables used improperly as interval variables in order to perform a linear regression, like some researchers do, despite best practice advice against it (Field, 2009, Bryman and Cramer, 2009) or the need to consider the variables as categorical, in order to perform instead a multinomial logistic regression.

As Norušis (2011, p.70) puts it: "You can modify the binary logistic regression model to incorporate the ordinal nature of a dependent variable by defining the probabilities differently. Instead of considering the probability of an individual event, you consider the probability of that event and all events that are ordered before it."

So the odds of an event happening, (dependent variable), influenced by the independent variable *j* could be written as follows (Norušis, 2011):

$$\theta_j = \text{prob}(\text{score} \leq j) / (1 - \text{prob}(\text{score} \leq j))$$

With the ordinal logistic model represented with the following equation:

$$\ln(\theta_j) = \alpha_j - \beta X$$

Where α_j is the threshold value, β is the coefficient of the independent variable X.

Selection of variables

With regards to the selection of the variables to be included in the ordinal regression tests performed, these have been selected on the basis of the research questions, but it was also necessary to pay attention at the number of predictors in relation with the number of cases collected. Field (2009) warns that the sample size must be high to detect even small effects, particularly when the number of predictors is large.

It makes sense therefore limiting the number of predictors to those that have shown a significant correlation and a correlation coefficient which is of at least 'modest strength', with a value between 0.40 and 0.69, as defined by Cohen and Holliday (cited in Bryman and Cramer, 2009).

The first research question that we posed was "Which factors do influence acceptability of wind farms? How do they relate one to each other?"

Clearly to answer it using the ordinal regression test earlier introduced, it was necessary to select the 'opinion about the wind farm variable', (itself an ordinal variable), as dependent variable of the test and, considering the size of their correlation coefficient, the following variables, bearing a significant correlation with the dependent variable, were selected to be included in the first ordinal regression test:

1. trust toward developers
2. local benefits/disadvantages
3. WF harms local health
4. WF helps climate change
5. WF looks bad on the landscape
6. WF improves the local economy
7. WF bring down property prices
8. WF is noisy
9. WF helps with fuel dependency

Test statistics

In order to carry out an ordinal regression that limited as much as possible the chances of empty cells resulting from the combination of the variables', single modes of answer, which could eventually lead to a reduced reliability of the 'goodness of fit' statistics test of the model (Norušis, 2011), the variables have been transformed from five point to three point scales.

Nevertheless SPSS returned the following warning with the results of the test:

"There are 364 (64,9%) cells (i.e., dependent variable levels by observed combinations of predictor variable values) with zero frequencies."

Which isn't unusual when many variables are combined in the test. Usually SPSS specifies if the number of empty cells is compromising specific outputs, which isn't the case. Previously it was tried to run the test with variables in the form of five point Likert scales and the warning was "The log-likelihood value is practically zero. There may be a complete separation in the data. The maximum likelihood estimates do not exist." Indicating that the test had instead collapsed.

In this case, it is possible to suppose that the high number of empty cells might depend by a polarization of views regarding the wind farm with fairly consistent answers across the sample between supporters and opposers of the project, i.e. supporter and opposers have consistently opposite views regarding the statements about advantages or disadvantages caused by the proposed wind farm.

Nevertheless the total possible number of cells was in this case 59.049 (resulting from testing 10 variables with 3 modalities each) and the empty ones are 364, which is not as seemingly SPSS reports the 65% of the total but evidently a proportion of a subset of cells, given, as SPSS states, by "dependent variable levels by observed combinations of predictor variable values".

Considering the tables produced by the test, the first is the '-2 Log Likelihood test', which tells us whether our model is more accurate in explaining the outcome of the dependent variable, the opinion about the proposed wind farm ('opinionwf3items'), than the base model acting by pure guessing based on the marginal probabilities of the outcome categories (ReStore, 2011b) (table 82).

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	550.259			
Final	198.840	351.419	18	.000

Link function: Logit.

Table 82 - Model Fitting Information

The Chi-Square statistic is significant at the .001 level meaning that the model offers a better fit to the data than the base model.

The next statistic presented by SPSS is the 'goodness of fit' which relates about the correspondence of the data collected to the data predicted by the model (table 83). The null hypothesis is that the fit is good therefore this should not be rejected and the significance level of the corresponding Chi-Square statistic should be larger 0.05. Nevertheless scholars agree (Norušis, 2011, ReStore, 2011b) that this statistic is not reliable when there is an high number of empty cells. In this case anyway the null hypothesis would not be rejected, pointing to a supposedly good fit of the model, (bearing in mind the little reliability of this statistic in this specific case).

	Chi-Square	df	Sig.
Pearson	259.687	354	1,000
Deviance	183.448	354	1,000

Link function: Logit.

Table 83 - Goodness-of-Fit

ReStore authors (2011b) recommend to rely on the 'pseudo R^2 statistics' instead to assess the fitness of the model when many cells are empty. Pseudo R^2 shows the proportion of variance of the dependent variable explained by the model. In this case, as shown in table 84 the Nagelkerke statistic, one of the most used (ReStore, 2011a), reports a value corresponding to 83% of variance explained by the model.

Cox and Snell	.734
Nagelkerke	.831
McFadden	.616

Link function: Logit.

Table 84 - Pseudo R-Square

The last test that is presented here before going in further detail into the model is the 'test of parallel lines'. This test aims to verify the necessary assumption of ordinal regression (also named assumption of proportional odds) that states that each independent variable has the same effect across its different thresholds (ReStore, 2011b). This test is considered to be of anti-conservative nature, i.e. often rejecting the assumption, which is the null hypothesis of the test, whenever there are many variables, the sample size is large or there is a continuous independent variable in the model (ReStore, 2011b).

In this case the null hypothesis is not rejected because the significance level exceeds largely the .05 level, therefore the null hypothesis is confirmed i.e. the assumption of proportional odd is confirmed[38] (table 85).

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	198.840			
General	170.664	28.177	18	.059

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

Table 85 - Test of Parallel Lines

The following part of the statistical analysis goes in detail assessing the relative importance of each independent variable in the model.

[38] The test initially came with a warning about its validity due to reaching the maximum number of iterations, therefore it was rerun increasing the number of iterations in the options tab of SPSS. I couldn't find anywhere an advice against this, not even in the SPSS online guidelines, which simply state to use a number of iterations of non-negative integer (IBM Knowledge center, 2012) Maroco (2007) simply advises to increase the numbers of step-halving when a similar warning presents about the maximum number of step-halving being reached .

It makes sense to remember that the dependent variable ‘opinion about the locally proposed wind farm’, which is represented in the table by the variable ‘opinionwf3items’, is coded with 1 expressing disagreement, 2 for neither agreement nor disagreement, 3 for agreement. The independent variables instead are all coded from 1 to 3 starting either with disagreement or agreement but always with the answer number 1 corresponding to a position most likely conducive to disagreeing with the proposed wind farm, e.g. the variable ‘Helpcc3’ refers to the statement regarding the wind farm helping with climate change and the response number 1 is expressing disagreement.

As it is possible to see from table 86, all the answers expressing a negative stance related with the wind farm have a negative significant relationship with the agreement towards the wind farm. Whilst the variables ‘Wfeconom3’, which is the statement of the wind farm improving the local economy, and ‘Propprices3’, a statement affirming the devaluation of property prices due to the wind farm, do not result significant in this test, while the opposite is true for their Kendall’s tau correlation tests presented in section 4.5.5, i.e. controlling for the variables included in the model, the variable ‘Wfeconom3’ appears lacking statistical significance in its relationship with the dependent variable. From what it can be seen from the data, there are four variables showing significant negative relationships with coefficients sensibly higher than the others, these are: trust towards the developers, local benefits/disadvantages, WF harms local health, WF helps climate change, all with negative coefficients, ranging from -2,5 (trust3) to -2,2 (helpcc3).

As it is held in literature (ReStore, 2011b) taking the exponent of the logit will return the odd ratio so in the case of the respondents disagreeing to the statement of trust towards the developers, exp(-2.52)=0.080, which means that compared to the respondents agreeing with the statement, there is less than one tenth likelihood that they will increase of a unit in the ordinal variable of ‘opinion regarding the wind farm’ ordered in a 3 point Likert scale from ‘disagree’ to ‘agree’. Similar ratios are clearly returned from the other variables presenting coefficients of similar magnitude.

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[opinionwf3items = 1,00]	-8.890	1.036	73.679	1	.000	-10.920	-6.860
	[opinionwf3items = 2,00]	-4.570	.763	35.842	1	.000	-6.067	-3.074
Location	[Trust3=1,00]	-2.525	.732	11.899	1	.001	-3.960	-1.090
	[Trust3=2,00]	-1.155	.650	3.161	1	.075	-2.428	.118
	[Benefdisadv_local3=1,00]	-2.350	.619	14.409	1	.000	-3.564	-1.137
	[Benefdisadv_local3=2,00]	-.413	.500	.682	1	.409	-1.394	.568
	[Wfharms3=1,00]	-2.398	1.126	4.532	1	.033	-4.606	-.190
	[Wfharms3=2,00]	-1.073	.458	5.495	1	.019	-1.970	-.176
	[Helpcc3=1,00]	-2.198	.579	14.394	1	.000	-3.333	-1.062
	[Helpcc3=2,00]	-1.288	.482	7.158	1	.007	-2.232	-.345
	[Lookbad3=1,00]	-1.423	.561	6.431	1	.011	-2.524	-.323
	[Lookbad3=2,00]	-.70	.491	.020	1	.887	-1.032	.892
	[Wfeconom3=1,00]	-.353	.584	.365	1	.546	-1.498	.792
	[Wfeconom3=2,00]	-.930	.507	3.358	1	.067	-1.924	.065
	[Propprices3=1,00]	-1.032	.578	3.189	1	.074	-2.164	.101
	[Propprices3=2,00]	-.832	.517	2.596	1	.107	-1.844	.180
	[Wfnoise3=1,00]	-1.463	.652	5.025	1	.025	-2.741	-.184
	[Wfnoise3=2,00]	-.589	.413	2.038	1	.153	-1.398	.220
	[Fueldepend3=1,00]	-1.196	.562	4.533	1	.033	-2.296	-.095
	[Fueldepend3=2,00]	-.473	.476	.986	1	.321	-1.406	.461

Table 86 - Parameter Estimates

Earlier in chapter three it was considered a meaningful hypothesis, the so called ‘low-cost hypothesis’ of Diekmann and Preisendorfer (2003) which argues that pro-environmental attitudes are mostly effecting in shaping behaviours in low-cost situations.

This hypothesis in this study was tested choosing to perform correlation tests using the selected cases answering neither benefits nor disadvantages when asked about their perception of local benefits or disadvantages, assuming that those who have otherwise answered leaning towards disadvantages or advantages would have perceived either the situation as ‘high cost’ or even ‘high benefit’.

These cases were tested in correlations between the variable ‘opinion about the wind farm’ and environmental attitudes variables, i.e. the variables ‘environment vs economy trade-off’, ‘physical place attachment’, ‘social place attachment’ and ‘environmental citizenship level’ which aside from ‘physical place attachment’ returned non-significant correlations: in this last case the correlation was statistically significant at the .05 level and modest in its strength (.2).

Later, after resetting SPSS to include all cases (respondents) it was tried to include in four separate ordinal regression models all the four attitudinal variables and these didn’t present a significant relation with the dependent variable ‘opinion about the locally proposed wind farm’, nor increased the variance explained by the model or led to a collapse of the model.

It has to be noticed though that the items trying to tap on environmental attitudes might have been too limited in their scope and that already tested multi-item scales might have been more suitable instruments given the possibility to produce a lengthier questionnaire.

4.6.2 Factors influencing the opinion about the co-operative scheme

The second research question that was posed for this research was:

‘Which factors do influence participation in wind farm co-operatives? How do they relate one to each other?’

The questionnaire tried to capture the sample’s feelings about a number of contentious statements about co-operative schemes, which were translated in the questions ranging from 15.1 to 15.7 of the administered questionnaire (see appendix A).

In order to assess how these issues could influence the opinion about the wind farm co-operative scheme and hence its acceptance, it was carried out an ordinal regression test, which had as independent variables the items corresponding to questions from n. 15.1 to 15.7 and as dependent variable the ‘opinion about community wind farm co-operative scheme’ corresponding to question 16 in the questionnaire.

Even in this test the statistics relating to the fitness of the model presented results pointing to a good fit, despite an initial warning again reporting a high number of empty cells, in this case 896 (78.9%).

The -2 Log likelihood test presented a Chi-Square value significant at the .001 level, hence showing a fit of the model which is better than for the basic model (table 87).

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	734.791			
Final	441.896	292.895	32	.000

Link function: Logit.

Table 87 - Model Fitting Information

The 'goodness of fit' statistics, not deemed to be reliable in this case because of the large number of empty cells, nevertheless presented a Chi-Square with a non-significant level of 1, meaning that the null hypothesis cannot be rejected, i.e. the model presents a good level of fit.

The pseudo R^2 test presents a fairly high level of variance explained by the model that for the Nagelkerke statistic is 70% (table 88).

Cox and Snell	.665
Nagelkerke	.704
McFadden	.378

Link function: Logit.

Table 88 - Pseudo R-Square

The test of parallel lines (table 89) results in a non-significant Chi-Square value, which means that the null hypothesis is not rejected hence respecting the necessary assumption of proportional odds[39].

[39] Even in this case, like for the previous ordinal regression analysis, the first execution of this statistic returned a warning about its validity, due to reaching the maximum number of step-halving, so this number was increased in the option tab of the ordinal regression test of SPSS as suggested by Maroco, (2007)

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	441.896			
General	355,742	86,153	96	,754

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

Table 89 - Test of Parallel Lines

In table 90 the coefficient estimates are presented.

As can be seen, four variables bear a significant relationship with the dependent variable - 'co-op scheme is a ploy', 'co-op revenue will benefit community', 'co-op will offer the worst compensation', 'co-op will create social capital'.

If it is looked at the 'co-op scheme is a ploy' variable it appears that, not surprisingly, respondents who strongly agree with the statement are less than 1/100 times likely to rise over the scale of the dependent variable ranging from 'the co-op is a very bad idea' to 'the co-op is a very good idea'.

Similarly those who strongly disagree with the statement that the 'co-op revenue will benefit the community' are about 1/50 times likely to move towards more support regarding the co-operative idea.

Those who strongly agree about the co-op offering the worst compensation are less than 1/10 likely to approve the co-operative scheme. Similarly, those who strongly disagree with the statement that the co-operative will build social capital are about 1/50 likely to approve the wind farm co-operative scheme compared with those who believe the opposite.

These results are not surprising and they confirm that issues of trust (the co-operative is a ploy) and the perception of lack of sufficient financial/material benefits (poor compensation, no or little revenue for the community) can have an impact over deciding about a scheme which is seen (Lipp and McMurtry, 2015) as easing acceptability of wind farms developments.

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[co-op_idea = 1,00]	-11,281	2,402	22,053	1	,000	-15,990	-6,573
	[co-op_idea = 2,00]	-9,310	2,372	15,400	1	,000	-13,960	-4,660
	[co-op_idea = 3,00]	-6,720	2,352	8,163	1	,004	-11,329	-2,110
	[co-op_idea = 4,00]	-2,691	2,327	1,337	1	,247	-7,251	1,869
Location	[c_ploy=1,00]	-4,705	1,042	20,401	1	,000	-6,746	-2,663
	[c_ploy=2,00]	-3,250	,955	11,582	1	,001	-5,121	-1,378
	[c_ploy=3,00]	-2,367	,931	6,466	1	,011	-4,191	-,543
	[c_ploy=4,00]	-1,123	,894	1,578	1	,209	-2,876	,629
	[c_revenue=1,00]	-3,867	1,579	6,000	1	,014	-6,962	-,773
	[c_revenue=2,00]	-4,566	1,472	9,629	1	,002	-7,451	-1,682
	[c_revenue=3,00]	-4,228	1,426	8,788	1	,003	-7,023	-1,433
	[c_revenue=4,00]	-2,797	1,378	4,121	1	,042	-5,497	-,097
	[c_divide=1,00]	2,046	1,484	1,903	1	,168	-,861	4,954
	[c_divide=2,00]	2,154	1,391	2,396	1	,122	-,573	4,880
	[c_divide=3,00]	2,306	1,391	2,749	1	,097	-,420	5,032
	[c_divide=4,00]	2,497	1,426	3,065	1	,080	-,299	5,292
	[c_undecided=1,00]	,213	1,715	,015	1	,901	-3,149	3,575
	[c_undecided=2,00]	,721	1,563	,212	1	,645	-2,344	3,785
	[c_undecided=3,00]	,375	1,549	,059	1	,808	-2,660	3,411
	[c_undecided=4,00]	,228	1,543	,022	1	,883	-2,797	3,253
	[c_compens=1,00]	-2,637	1,147	5,289	1	,021	-4,885	-,390
	[c_compens=2,00]	-1,548	1,052	2,164	1	,141	-3,610	,514
	[c_compens=3,00]	-1,354	1,051	1,660	1	,198	-3,415	,706
	[c_compens=4,00]	-1,909	1,098	3,022	1	,082	-4,061	,243
	[c_socap=1,00]	-3,292	1,093	9,070	1	,003	-5,434	-1,149
	[c_socap=2,00]	-3,010	,922	10,669	1	,001	-4,817	-1,204
	[c_socap=3,00]	-1,864	,867	4,627	1	,031	-3,563	-,166
	[c_socap=4,00]	-1,274	,822	2,402	1	,121	-2,886	,337
	[c_antis=1,00]	,024	1,826	,000	1	,990	-3,556	3,604
	[c_antis=2,00]	-,206	1,783	,013	1	,908	-3,701	3,288
	[c_antis=3,00]	,817	1,796	,207	1	,649	-2,703	4,337
	[c_antis=4,00]	,298	1,773	,028	1	,866	-3,177	3,773
	[c_nodiff=1,00]	-1,104	1,151	,920	1	,337	-3,359	1,152
	[c_nodiff=2,00]	-,011	1,096	,000	1	,992	-2,159	2,137
	[c_nodiff=3,00]	-,555	1,091	,259	1	,611	-2,694	1,584
	[c_nodiff=4,00]	,374	1,155	,105	1	,746	-1,890	2,637

Table 90 - Parameter Estimates

4.6.3 Factors influencing the decision to invest in co-operative wind farms

The following test aims to assess through a binomial logistic regression, which are the factors mostly influencing the decision to invest in co-operative wind farms.

Binomial logistic regression

Binomial logistic regression is a necessary choice for a multivariate analysis when the dependent variable has a binary outcome, like in this case where the sample was asked whether they would invest or not, the reason being that linear regression cannot be used because the dependent variable would not respect the assumptions of normality of the distribution and homoscedasticity, a constant variance of errors at all levels of the variable (ReStore, 2011a).

The logistic function can be written as:

$Log\ [p/(1-p)] = a + bx$

With the left term indicating the log of the odds of the independent variable and in the right term *a* is the intercept and *b* is the coefficient of the independent variable *x*.

The log can eventually be converted in the predicted probability

$p= Exp(a+bX) / [1 + Exp(a+bX)]$

The test involved only 229 cases because a large number of the returned questionnaires hadn't been filled in this section. Nevertheless the number of 229 is enough to detect at least a medium effect (Field, 2009).

The dependent variable asking about the willingness to invest, question 14 of the questionnaire, (see appendix A), was coded as follows (table 91):

Original Value	Internal Value
no	0
yes	1

Table 91 - Dependent Variable Encoding

The model tested, including the variables corresponding to questions from 15.1 to 15.7, will compare with the baseline model that predicts the outcome purely on the basis of which category occurred most often in the data set, therefore achieving a 53.7% of correct predictions.

All the variables are introduced in the model tested in one block, following the advice of Field (2009) who recommends this procedure unless sound motives supported by previous research would suggest otherwise.

The ‘omnibus test of model coefficients’ tells if the new model has the -2 log likelihoods statistic significantly reduced compared to the baseline model which would mean that the new model is capable of explaining more of the variance in the outcome. As can be seen (table 92), in this case the Chi-Square value is significant at the .001 level.

		Chi-square	df	Sig.
Step 1	Step	250.331	7	.000
	Block	250.331	7	.000
	Model	250.331	7	.000

Table 92 - Omnibus Tests of Model Coefficients

The model summary (table 93) provides the pseudo-R^2 statistic that presents a Nagelkerke value of .888 suggesting that the model explains 88% of the variance in the outcome.

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	65.867[a]	.665	.888

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

Table 93 - Model Summary

The Hosmer and Lameshow test tells whether the model is a “good enough fit” (ReStore, 2011a) for the data, which corresponds to the null hypothesis, therefore this has not to be rejected and p must be higher than .05, which is the case in this test (table 94).

Step	Chi-square	df	Sig.
1	3.778	8	.877

Table 94 - Hosmer and Lameshow Test

The classification table (table 95) tells the percentage of correctly predicted outcomes by the model that it can be compared with the same statistic of the baseline model, which stands at about 54%. The percentage of correct prediction of the model reaches instead nearly 94%, therefore presenting a dramatic improvement.

	Observed	Predicted		
		decision to invest		Percentage Correct
		no	yes	
Step 1	decision to invest no	115	8	93.5
	yes	6	100	94.3
	Overall Percentage			93.9

a. The cut value is .500

Table 95 - Classification Table (a)

Looking in detail the variables in the model (in table 96), it is noticeable that all but two have a significant relation with the dependent variable, these correspond to the statements: 'I don't care about the wind farm and so I would not care about the co-operative' and 'If people around me, in my community, would support it, so would I'. The first statement was presenting a situation of utter disengagement, while the second was trying to capture the relevance of social pressure about the possibility of participating in the project.

The two variables with a significant relation that stand out in this analysis correspond instead to the statements 'I think that it would be a good investment opportunity', (i_ok in the table), which presents a positive coefficient B of 2,3 that tells us that respondents who scored 'strongly agree' are about 10 times more likely to invest than those who strongly disagreed.

Similarly, those who strongly agreed with the statement 'I couldn't afford to buy the shares', (named i_noafford), were likely to invest one time out of ten compared with those who answered 'strongly disagree'.

Interestingly these economic motives appeared to be the strongest, although immediately followed by opposition to the wind farm, (i_oppose), and the wish to do something about climate change, (i_envattitd). The least important was the variable tapping on the sense of opportunity of shaping the project ('I would be able to have a say in the development of the wind farm and its management', 'i_havesay') which showed that those who strongly agreed were three times more likely to invest than those who strongly disagreed.

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	i_ok	2.328	.530	19.290	1	.000	10.257
	i_oppose	1.752	.526	11.086	1	.001	5.767
	i_envattitd	1.532	.478	10.277	1	.001	4.629
	i_noafford	-2.048	.455	20.299	1	.000	.129
	i_socpressu	.056	.430	.017	1	.896	1.058
	i_nocare	.022	.505	.002	1	.965	1.023
	i_havesay	1.117	.429	6.772	1	.009	3.054
	Constant	-17.226	4.162	17.130	1	.000	.000

a. Variable(s) entered on step 1: i_ok, i_oppose, i_envattitd, i_noafford, i_socpressu, i_nocare, i_havesay.

Table 96 - Variables in the Equation

4.7 Conclusion

This chapter has presented results and discussed their relative significance, as evaluated by appropriate statistical tests. The extent to which the results obtained support the theoretical framework developed in chapter 1 is discussed in the next chapter.

5 Chapter 5 Discussion

This thesis contributes to a topic that is still very relevant in current environmental social research, as the considerable amount of published papers in recent years on the topic of social acceptability of wind energy shows, along with a continuous effort to refine theories of social acceptability of renewable energy (Bell et al., 2013, Batel and Devine-Wright, 2015, van Veelen and Haggett, 2016).

Ambitious international and government renewable energy targets push the United Kingdom towards a further exploitation of renewable energy, of which wind is arguably one the most widely available across the country (DECC, 2011).

In this context, research is focusing on specific facets of wind energy schemes which could possibly ease acceptability of local residents around proposed sites and provide wider social and economic benefits. Particularly community projects are considered as a positive type of wind developments, nevertheless they are not devoid of a number of complications which make them less likely to succeed than purely commercial projects, for a number of reasons chiefly pertaining to financial and social aspects (Haggett and Aitken, 2015).

In this context co-operatives are seen as a type of community scheme that presents some advantages, such as the possibility of citizens to participate in the ownership and hence in benefiting from the revenue of a wind farm, creating a social network and developing community skills; but also potential shortcomings are envisaged, such as divisions between those who join and those who don't (Haggett and Aitken, 2015).

In this research context, this thesis adds a contribution which is focusing on social acceptability of wind farms and the co-operative scheme, particularly on the perception of such scheme by local residents affected by a pending proposal for a local wind farm.

The two topics are obviously strictly related, particularly because, as earlier mentioned, co-operatives are seen as one of the means to ease acceptability (Bauwens et al., 2015, Lipp and McMurtry, 2015) along with community benefits schemes (Walker et al., 2014).

5.1 Can an integrated rational choice and attitudes framework explain acceptability of wind farms?

The idea that community benefits and co-operative schemes can ease acceptability leads to recall what has been hypothesized earlier in this work, in chapters one and three, about

the importance of perceived costs and benefits in shaping proenvironmental behaviours and in this specific case acceptability of locally proposed wind farms. The first research question posed in section 2.1 in fact asked:

'Which factors do influence acceptability of wind farms? How do they relate to one another?'

In an effort to answer this question, it was proposed in chapter one an integrated rational choice and attitudes framework to explain how attitudinal factors, personal resources and contextual factors would influence acceptability of wind projects and participation in a co-operative wind farm.

5.1.1 The low cost hypothesis

In 2007, in the context of another research project, this same framework, using as a key underlying assumption the low-cost hypothesis of Diekmann and Preisendörfer (2003), was outlined in a conference paper (Pellegrini-Masini, 2007) and discussed with regards to household energy saving behaviours. In the meantime several other authors have elaborated further on the 'low-cost hypothesis' input on research about motives of pro-environmental behaviours and have recognized the importance of low-cost vs high-cost situations (De Groot and Steg, 2009, Steg et al., 2014).

What do the empirical studies conducted in this PhD research project add about these efforts to frame theoretically proenvironmental behaviours?

Perceived costs and benefits

The postal survey appeared to confirm the qualitative study: the perception of costs and benefits associated with the proposed wind farms seemed to influence the decision to support or not the project.

This can be seen by the relatively high correlation coefficients of the variables 'benefitscostsvalue' and 'local benefits/disadvantages' with the variable about the opinion regarding the proposed wind farm, (see section 4.5.3), which resulted in the two highest bivariate correlations with the opinion about the wind farm variable. The summary table of bivariate correlations presented in section 4.5.5 shows that the second highest correlation coefficient is the .684 ($p<.000$) of the variable 'local

benefits/disadvantages' just after the .731 ($p<.000$) of the variable 'benefitscostsvalue', a scale built on the items asking respondents to score their agreement on specific hypothetical costs and benefits related with the proposed wind farm, but in this case of both local and non-local impact.

Further, looking at the ordinal regression analysis, (in section 4.6.1), which held as its dependent variable the 'opinion about the proposed wind farm', it was found that along with three other variables, with similar coefficients, (namely 'trust towards developers', 'the wind farm harms local health', 'the wind farm helps with climate change'), the perception of local costs and benefits was one of the main indicators of support or opposition, confirming that a subjective assessment of local benefits and costs is likely to influence any individual's stand about a proposed development: i.e. the more respondents perceived high costs of having a wind farm in their locale, the more they opposed.

Two of the four major variables influencing acceptability of proposed wind farms that emerged from the ordinal regression analysis (section 4.6.1) were 'the wind farm will harm the health of my community' and 'the wind farm will help to fight climate change'. The first would be clearly a major cost which, if perceived, can discourage any support, while the second is a wider benefit affecting the global rather than the local environment and therefore it's a statement which, differently from the other three variables standing out from the ordinal regression test, doesn't regard only the local community. Despite that, it is a central issue of the debate around the importance of a wider deployment of wind energy, which would be perceived as arguably the major environmental benefit by supporters and perhaps as the main claim to be undermined by opposers.

Somewhat surprisingly in this ordinal regression analysis the visual impact was relatively less important, albeit statistically significant, with a similar coefficient as the variables concerning the belief of the wind farm being noisy and its contribution in helping to reduce national fuel dependency.

Other variables included in the test, which regarded the possible decrease of property prices due to the presence of the wind farm and its possible positive contribution to the local economy, didn't result in significant correlations with the dependent variable in the ordinal regression analysis, despite having showed significant bivariate non-parametric correlations with the opinion about the wind farm variable.

5.1.2 Pro-environmental attitudinal variables

Pro-environmental attitudinal variables were tested in the questionnaire directly, through confronting the respondents with an imaginary trade-off between the economy and the environment, and using concepts such as place attachment, (in its physical and social dimensions) and environmental citizenship, (which was the object of research question number four).

Attitudinal variables didn't fit in the ordinal model, even though several attempts were made, including separately the single variables 'environmental citizenship level', 'economy vs environment trade-off', 'physical place attachment' and 'social place attachment', which either resulted in the collapse of the model, (the case of place attachment variables), or in non-significant coefficients.

The bivariate correlations between these variables and the 'opinion about the wind farm' variable were significant ($p<.001$) but with modest strength ($x\leq.2$) only for 'economy vs environment trade-off', 'physical' and 'social' place attachment, as reported in the previous chapter, (see table in section 4.5.5).

Also, when correlation tests were carried out between these attitudinal variables and opinion about the wind farm, after selecting for the cases of only those respondents who thought that the presence of the wind farm would have not brought locally neither advantages nor disadvantages, the results showed, in all but one case, non-significant correlations. The only significant correlation (Kendall's tau test, $p<.05$) was for the variable regarding physical place attachment (item n. 20, Appendix A) that presented a modest coefficient of .204. This could be interpreted at first sight like a marginal role of pro-environmental attitudes, environmental citizenship and place attachment in determining support or opposition towards a locally proposed wind farm, even for those respondents that consider the perspective of having a wind farm built in their locale as a 'low cost' situation. Arguably this observation could undermine the assumption of the low cost hypothesis (Diekmann and Preisendorfer, 2003) that attitudes play a role in low cost situations, but the specific case of acceptability of wind farms, as discussed in section 1.5.3, leaves the possibility that pro-environmental attitudes might play a role both for and against a proposed wind farm development, depending on the subjects being moved by a type of local conservationist environmentalism rather than a global environmentalism, in what has been named a "green on green" controversy (Warren et al., 2005). A suggestion that this might be the correct interpretation comes from the evidence that for the same selected cases, i.e. those respondents who didn't envisage

neither local advantages nor disadvantages, a significant positive correlation, (Kendall's tau test, x= .389, p<.000), was instead found between the variable regarding the statement 'the wind farm will help to fight climate change' and opinion about the wind farm and also a correlation was found between the variable 'looks bad on the landscape' and opinion about the wind farm (Kendall's tau test, x=.579, p<.000): these were the largest correlations found, for these selected respondents, within the set of correlation tests between each of the variables, (items n. 11-11.8, Appendix A), measuring specific costs and benefits of the proposed wind farm and the opinion about the wind farm variable. Both these correlations actually regard different environmental impacts of the wind farm, one on the global environment, specifically on climate change, and the other on the local environment, in particular on the landscape, hence it seems plausible to think that, for those respondents considering the wind farm project as a low cost situation, proenvironmental attitudes came into play in determining their support or opposition but without addressing univocally respondents towards a choice of support or opposition. This hypothesis can be further supported by looking at the frequencies of answers on the variable regarding environmental citizenship, (items 18-18.3 in Appendix A), for the selected cases of the respondents that in the variable proposing a trade-off between the economy and the environment, (items 19-19.3, Appendix A), chose the most pro-environmental option: a considerable amount of these respondents (27%) actually appeared more sensitive to protecting the local environment, rather than the global environment (61.5%), thereby showing that a sizable part of self-represented environmentalists are concerned more with defending the integrity of their local environment than that of the global environment.

5.1.3 Contextual factors

It was suggested in the literature review (section 1.5.5) that within the contextual factors influencing acceptability of wind energy were included those conditions specific to the social context, like issues related with procedural justice, or specific community schemes, including the co-operative scheme. These are discussed in the following paragraphs.

Trust

In the aforementioned group, (in section 5.1), of variables included in the ordinal regression analysis, which appeared to influence the most support and opposition, is present also 'trust about the developers' that has been confirmed as an important issue in

recent research in Scotland (Haggett et al., 2014). Trust could be considered a contextual social resource (Misztal, 2013), that magnifies or reduces the perception of costs and benefits, whether the relations with the developer are positive and trust building, or negative and leading to a trust deficit. Trust in fact was found to be correlated with the perception of local advantages and disadvantages expected about the proposed local wind farm with a .000 significance level and a coefficient of .6 (Kendall's tau correlation test), therefore showing that the respondents who lacked the most trust towards the developers tended to see the least possible local benefits deriving from the proposed wind farm. The importance of 'trust' was confirmed not only in the ordinal regression analysis, earlier mentioned in this section, where along with three other variables presented one of the highest coefficients, but also in the bivariate correlation test, where again it was within the four variables presenting the highest correlation coefficient with the opinion about the wind farm variable (specifically .622, significant at .000 level, see table in section 4.5.5).

The issue of trust appeared also as particularly important in the case of Westmill wind farm, as emerged in the analysis of the qualitative study, (see section 3.2), hence suggesting that even a co-operative community led scheme might raise issues of trust.

In fact, this was confirmed by the survey, when with item 13 (see Appendix A) was asked the level of agreement of respondents with the statement of the co-operative being just a ploy to buy residents' consensus: the relative majority of respondents with the share of 44% agreed or strongly agreed (see section 4.4.4). Further, testing for correlation between item 13 and the opinion about the co-operative scheme, it was found a significant correlation (Kendall's tau test, $p<.000$, $x=.613$) showing that the respondents considering 'the co-operative scheme as a ploy' to buy consensus were more inclined to consider the co-operative scheme as a bad idea. Finally, also the ordinal regression analysis, presented in section 4.6.2, which had as dependent variable the opinion about the co-operative scheme (item 16, in Appendix A), showed that the belief of the co-operative being a ploy was the item having the highest significant coefficient of all the variables included, confirming again that the issue of trust, even with regards to the co-operative scheme was the most important in shaping opinions about the scheme itself.

Information

In section 1.5.5, the provision of information about the wind farm was indicated like an element of procedural justice in relation with wind farms siting.

In the study that was presented in chapter four, information, (item n.9 in the questionnaire), appeared to be correlated with the opinion about the proposed wind farm, (see section 4.5.4), implying a more negative opinion about the wind farm for those respondents who disagreed with having been thoroughly informed.

Unsurprisingly a correlation was found also between the information variable and the variable about local benefits and disadvantages (Kendall's tau test, x=.275, p<.000), hence suggesting that the feeling of having been little informed influenced negatively the appraisal of future benefits and disadvantages.

The co-operative scheme

In earlier chapters, the co-operative scheme was included along with the community benefits scheme within the group of the contextual factors.

About the co-operative scheme, research question n.2 and 3 in section 2.1 asked:

'Which factors do influence participation in wind farm co-operatives? How do they relate one another?'

And 'Is the co-operative scheme effective in eliciting participation of local communities and in overcoming opposition toward wind developments? Why?'

Looking in more detail at the findings regarding the co-operative scheme and particularly the second ordinal regression analysis presented in section 4.6.2, it is apparent that the key issue affecting the dependent variable, the opinion about the co-operative scheme, is 'trust', as already discussed in section 5.1.1.

To a lesser extent, the ordinal regression showed that the variable regarding the belief that the co-operative will give the community the chance to benefit from the revenue of the wind farm plays a role in shaping the judgment about the scheme. This is not surprising and this is actually the strength, or at least one of the main benefits, of the co-operative scheme, a belief held by 51% of the respondents and denied by not more than 18%.

Following this variable, with smaller coefficients, there are the variables regarding the possibility of the scheme to form a stable community network, ("social capital"), and the belief that the co-operative will offer the worst compensation for those who oppose.

Both these statements had considerable numbers of respondents agreeing with them, outnumbering the number of those disagreeing. It is meaningful that about 41% of the

respondents would agree with the benefit of creating a stable network inside the community generated by the co-operative scheme, this in fact can be seen as perhaps the second major benefit of this scheme, aside from benefiting the community of the revenue. Also, another important finding is recognizing the shortcomings of the model, i.e. the fact that it might not be inclusive, because offering a poor compensation to those that oppose. This finding is not unexpected: in this case about 37% of the respondents agreed with the statement, again outnumbering those who disagreed.

In the ordinal regression, the variable regarding the suitability of the scheme to win over the support of undecided residents, (item 13.3 in Appendix A), didn't show to be a statistically significant factor to shape the opinion about the co-operative scheme. A very modest significant correlation, (Kendall's tau test, $x=.10$, $p<.05$), was found instead between the two variables when tested. The vast majority of the respondents, about 44% neither agreed nor disagreed with the statement, while about 30% disagreed, outnumbering by a few percentage points those agreeing. Very interestingly when respondents answered about a specular question regarding the co-operative scheme not making any difference in terms of support for the wind farm, an overwhelming majority 65.5% replied that they agreed, while only 9.5% disagreed. Nevertheless, this variable was not found in a statistically significant correlation with the opinion about the co-operative scheme variable, either in the Kendall's tau test or in the ordinal regression analysis, meaning that this belief didn't appear to affect the judgement of respondents about the scheme itself.

About 42.5% of respondents agreed that the co-operative would have created a permanent divide within the community between those who joined the co-operative and those who opposed the wind farm, while about 20% disagreed. This variable was showing a highly significant ($p<.001$) bivariate correlation with the 'opinion about the co-operative' variable, although it was of moderate strength (.47), while in the ordinal regression test it didn't reach the level of significance (of $p<.05$).

When respondents were asked if they would invest in the co-operative scheme, 56% answered no and 44% yes. As reported earlier in section 4.6.3, the main reasons, analysed through a binomial logistic regression, were of economic nature: chiefly the belief that it would be a good investment and the belief of not being able to afford the shares. These motives were followed by two attitudinal variables corresponding to the statements: 'I oppose therefore I will not join' and 'I believe that I should do something about climate

change, therefore I will join'. To a lesser extent it also played a role the belief of having the possibility to have a say in the project and in its management.

22.5% of respondents declared that they couldn't afford to buy the shares and 27% neither agree nor disagree, which are not negligible proportions, considering that the aim of the co-operative is fostering participation benefiting the individuals joining with a revenue and a sense of ownership. This might have been caused by a hypothetical price per share that it was indicated in the questionnaire, which was possibly perceived as too high (£ 250). Nevertheless this finding strengthens the argument that economic costs are to be considered carefully when a co-operative scheme is proposed to a community, even though it was not possible to find a statistical relation between the variables 'estimation of income per family member' or 'socialcontext2' (a variable already introduced in section 4.5.2) and the decision to invest, therefore suggesting that the perception of cost is considered higher when compared with alternative purchases, rather than in absolute terms.

Despite the possible shortcomings of the co-operative scheme, when respondents were asked to judge it, 52% said that was an excellent or a good idea while only 22% considered it a bad or very bad idea. Even when respondents were confronted with the choice between a co-operative scheme and a community fund scheme, just over 38% preferred the co-operative, 26% the community fund and about 36% declared no preference.

5.1.4 Personal resources

As mentioned in earlier chapters, economic deprivation could be an issue affecting the participation in the co-operative scheme but actually multiple deprivation could be an issue for any type of participation, in fact as noted in the chapter four just 14% of the returned questionnaires were from the most deprived area surveyed, Bracco, and it was found a significant (at .001 level) even though modest correlation (x=.2) between having an opinion about the wind farm and the level of deprivation.

Income

More specifically looking at income, the picture is mixed, as earlier mentioned, the affordability of shares appearing as one of the main issues, in the binomial logistic regression analysis, influencing the choice of investing in a co-operative wind farm, but actually it wasn't found any statistically significant relation between the variables 'household income' or 'estimation of household income per family member' with the

choice of investing. So if affordability is an issue, it is apparently something that can be perceived as such by households of different economic condition, who would assess it against concurring purchases.

The 'estimation of income per family member' nevertheless influenced negatively in a very modest way the opinion about the wind farm (Kendall's tau test, x=.-111, p<.014).

Further, when tested for correlation, it was found that the variable 'estimation of income per family member' was negatively correlated with the variables 'benefitscostsvalue' (the scale measuring the subjective perception of costs and benefits related with the proposed wind farm) and with the variable 'local benefits disadvantages' (respectively, Kendall's tau tests, x=-.090, p<.028 and x=-.144, p<.003) thereby implying that there is a small disposition of respondents belonging to higher income families to seeing more local and general disadvantages compared with those being members of lower income families.

It was assumed in previous research, (Toke, 2005b, van der Horst and Toke, 2010), (see section 1.5.4), that more economically affluent areas would lobby more effectively against proposals in their locale to protect both the integrity of a perceived highly valuable landscape and the value of their properties. Analysing the survey data, it was found only a modest confirmation for the hypothesis that higher income households would oppose a proposed wind farm because of wishing to protect the integrity of the landscape, in fact, a small significant correlation was found between the variables 'estimation of income per family member' and 'the wind farm will look bad on the landscape' (Kendall's tau test, x=-.124, p<.008), while no correlation was found between income and the statement about the wind farm causing devaluation of property prices.

Proximity to the wind farm site

Proximity to the wind farm proposed site resulted in previous studies as a variable influencing acceptability. In this case, mere belonging to either one of the distance bands, used to sample the residents, wasn't *per se* associated significantly with the opinion about the wind farm, perhaps because respondents didn't know exactly how far they lived from the site.

When instead it was looked at the variable 'seeing the wind farm site from home', a significant association, even if modest, with the 'opinion about the proposed wind farm' was found (Cramer's V test, x=.272, p<.000). Similarly a negative correlation was found,

between the frequency of sight of the site and the opinion about the wind farm but again with a modest coefficient (see table in section 4.5.5).

Interestingly 'seeing the wind farm from home' was associated with the variable asking about local benefits and disadvantages (n. 10 in Appendix A), (Phi test, x=.342, p<.000), hence suggesting that the fact of seeing from home the wind farm site was influencing the perception of local benefits or disadvantages.

Equally, a negative correlation was found between the frequency of sight of the designed site and the perception of local advantages and disadvantages (Kendall's tau test, x=-.166, p<.011) thereby implying that the subjects seeing more often the site were more disposed to foresee more disadvantages than benefits.

Other personal resources variables

The questionnaire comprised other variables that were indicated in previous chapters as personal resources and namely: level of education and knowledge about wind energy.

These were not found significantly correlated with the opinion about the wind farm (only 'knowledge about wind energy' was found significantly correlated after collapsing the opinion about the wind farm variable from a five to a three answer mode variable).

Nevertheless, a modest correlation can be found between both of them and the opinion about local benefits and disadvantages. In the case of education (Kendall's tau test, x=-.152, p<.001), it appeared that less formally educated respondents were a little more disposed to foresee local advantages than higher educated individuals.

Similarly, individuals more knowledgeable about wind energy showed to be a little less inclined to anticipate local advantages from the future wind farm (Kendall's tau test, x=-.094, p<.028).

5.1.5 Final remarks

In this section, 5.1, the framework first proposed in chapter one has been discussed in the light of the empirical work conducted within this PhD project. In the conclusions of chapter three, it was argued that the qualitative study offered support for the proposed theoretical framework integrating rational choice and attitudes. The same could be essentially said in the light of the data collected through the survey presented in chapter four. Nevertheless some earlier expectations need now to be downplayed: in particular

income, despite showing that there is a correlation between this resource and the perception of costs and benefits related with the proposed wind farm, nevertheless this appears modest. Further, income doesn't seem to be correlated with the specific concern about the loss of property values and only modestly with the integrity of the landscape, two specific concerns indicated in literature as supposedly held by high incomers, (as earlier discussed), and that appeared confirmed by the qualitative study.

Actually 'trust', a contextual factor, appeared as the single main issue influencing the appraisal of future costs and benefits related with the proposed wind farm, confirming the qualitative study and implying the importance of building this important feature of local debates and relations. After trust, 'seeing the wind farm from home was the second most important personal resource influencing the opinion about costs and benefits related with the future wind farm: a result, this, which appears coherent with the literature reviewed in chapter one and with the findings of the qualitative survey (see chapter three).

The co-operative scheme instead, which was envisaged to be a contextual factor potentially suitable to swing undecided people, even after considering the responses obtained by the qualitative survey, didn't meet this expectation in the results of the survey, where respondents largely answered that it wouldn't' have made a difference in terms of consensus. Further, again, 'trust' appeared as an issue that was pivotal in shaping the opinion of a possible wind farm co-operative, appearing in this as a confirmation of the findings of the interviews.

Finally, it is worth recalling what was said earlier about proenvironmental attitudes. They appear to sustain two antagonist types of environmentalism, a global and a local, which are clearly in contrast in relation with the specific matter of wind farms siting.

5.2 Policy considerations

The co-operative scheme cannot be a solution in overcoming local opposition to wind farm proposals, but can provide an opportunity more to those who are open minded about wind energy in their locale, offering them the possibility to gain revenue from a relatively safe investment and giving the opportunity to the community to develop a network that might serve well the community strengthening social relations and placing the community in a good place to take advantage of other opportunities.

The co-operative scheme, though, should not be conceived without some form of community benefit which would grant the whole community the possibility to derive some positive effect as a consequence of hosting the wind farm, otherwise this might create a situation in which those who have opposed the wind farm, and hence have not joined the scheme, would not benefit from it in any possible way. As mentioned earlier, 'trust' is a key aspect even in judging the co-operative scheme, whether, like in the Westmill case, the main party proposing the co-operative is also the landowner who would benefit from its presence on his land, or anyway somebody who could be seen to gain any personal advantage from it, this clearly would compromise the possibility to generate trust between the developer, (being this the co-operative itself or a commercial entity), and the community. Hence, it makes sense that policymakers will consider to make mandatory for local authorities, not only to assist communities interested in community ownership schemes, as suggested by Haggett and Aitken (2015), by providing information and project management assistance, but also that will directly step in, overseeing the process of building community ownership schemes, ensuring that pre-established guidelines are set up to provide a fair community space of discussion and deliberation and that these are followed. This would help preventing or at least mediating potential conflicts and would help to generate a sense of fairness and ultimately trust about the project.

As pointed out by scholars (Haggett and Aitken, 2015, Slee, 2015) there are numerous potential benefits for communities developing community ownership schemes but these risk remaining untapped if current legislation doesn't change, providing the resources needed for communities to develop these opportunities. Particularly, establishing a mandatory requirement for any wind farm development to provide both a community benefit fund and the chance for the local community to co-own at least a share of the project, (like the current Danish legislation imposes, Slee, 2015) would ensure that the perceived costs for wind deployment are minimized and that the perceived potential benefits are on the contrary maximised, leading to reduced opposition.

In this regard DECC has outlined a 'community energy strategy' (DECC, 2014), which appears as an attempt to address the issue of availability of resources to engage in community schemes and that aims to make community ownership widely available for renewable energy developments, although at the moment a voluntary scheme has been encouraged led by the 'shared ownership taskforce' (DECC, 2015b), a consultation group including commercial developers and community organization representatives. The UK

Government has stated that whether this approach will fail the provision of available shared ownership will be made mandatory for any commercial development (DECC, 2015a). In Scotland instead, the Scottish Government (2015) has recommended the developers to offer shared ownership for all the renewable energy projects above 50 kW since 2015. This position has been further strengthened by a communication by Scotland's chief planner, John McNairney (2015), who in a letter addressed to the heads of planning at Scottish planning authorities, in November 2015, stressed the significance of shared ownership, which despite not being part of the material considerations in determining the acceptability of a project in planning terms, nevertheless is important because the economic and socio-economic impact of a project are relevant material considerations.

Hence, it appears that in the minds of policymakers the importance of community ownership is becoming more apparent, yet both in Scotland and in the rest of the United Kingdom the ambiguity of a planning system that merely encourages community ownership might be abandoned by the explicit policy choice of making mandatory the provision of a shared ownership scheme for every renewable energy project.

6 Chapter 6 Conclusions

This PhD research project set out to answer the following research questions:

1. Which factors do influence acceptability of wind farms? How do they relate to one another?
2. Which factors do influence participation in wind farm co-operatives? How do they relate to one another?
3. Is the co-operative scheme effective in eliciting participation of local communities and in overcoming opposition toward wind developments? Why?
4. Do individuals perceive their status of citizens as a source of moral obligation to protect the environment? (In other words: Is environmental citizenship perceived as a source of moral obligation to protect the environment?)

In order to answer the research questions, an original contribution has been made both theoretically and empirically in elaborating and collecting evidence over what influences the acceptability of wind farms and how the co-operative scheme can play a role in this regard. Particularly, the choice of conceptualizing an interpretative theoretical framework integrating rational choice theory, attitudinal theories and resource based models, appeared to fit reasonably well the data collected and shows the potential to be employed further to research other environmentally significant behaviours.

With regards to research question n.1, it was showed how perceived costs and benefits, and particularly (in order of importance, from the higher to the lower): the fear that the wind farm would harm the health of the local community, the belief that the wind farm would help with climate change, the wind farm being considered noisy, the wind farm considered as bad looking on the landscape and finally the wind farm believed to help with fuel dependency, exercised an influence on acceptability of the proposed wind farm.

While at the same time, personal and social resources, specifically ‘trust in the developers’, ‘seeing the wind farm site from home’ and ‘information about the wind farm’, (just to name the most important), influenced the perception of entailed costs and benefits for the proposed wind farm.

Attitudes about the environment and about the place (i.e. place attachment), played a role too, but as minor factors influencing residents’ opinion about the wind farm. Particularly, it emerged that the individuals who displayed proenvironmental attitudes were not all sensitive to the protection of the global environment and hence supporting the wind farm,

a considerable amount showed to be more concerned about the integrity of their local environment.

In answering research questions n. 2 and 3, it was found that the co-operative scheme did not appear to be considered suitable of convincing undecided residents about supporting a locally proposed wind farm. The scheme was regarded as potentially divisive, nevertheless, respondents expressed predominantly favourable views about the scheme and they preferred it over a mere community benefits scheme.

The issues that appeared to influence most the opinion about the co-operative scheme were in decreasing order of importance: 'trust' i.e. the fear that the scheme might be a 'ploy' to facilitate the support for the wind farm, the expectation that the revenue of the scheme would benefit the community, the anticipation that the co-operative would create social capital and finally the concern that the co-operative would offer the worst compensation for the opposers.

The main reasons instead that influenced the intention to invest, appeared to be in decreasing order of importance: the consideration that the investment was a good opportunity, the belief of not being able to afford the purchase of the shares, the fact of opposing the wind farm, the belief of having to do something about climate change and finally the belief of being able to have a say in the co-operative project and its management.

Regarding 'environmental citizenship, (research question n.4) respondents appeared largely to agree with having a sense of responsibility towards the environment, and they seemed polarized between the preference for the protection of the global environment and protecting local environment, while disregarding the national environmental dimension or the option of rejecting any responsibility for environmental matters. Nevertheless this variable did not appear significantly correlated with the opinion about the wind farm.

Some policy considerations were presented in chapter 5 about the co-operative scheme which are worth reiterating briefly in this conclusion: whilst it is true that the co-operative scheme of local ownership of wind farms doesn't appear to be a certain way of winning over not only opposers but possibly even undecided people, still it appeared to be seen favourably and therefore, together with a community benefits scheme, which can be complementary, could still find a place within a number of options of community ownership schemes that, if proposed to a local community, would provide an opportunity to local residents of benefiting from renewable energy. The co-operative scheme in fact

could be providing a sense of ownership, strengthening their community networks, possibly making the community more aware of energy issues and more suitable to address future collective local issues or opportunities.

All this considered, it has to be seen favourably that the Scottish and UK governments recommended that all developers offer the possibility of shared ownership to local communities in both Scotland and the rest of the United Kingdom. Nevertheless, for the same reasons, it could be argued that local shared ownership could be offered as a mandatory requirement for any wind farm planning application and that precise mandatory guidelines on its implementation could be set and followed by all the developers, under the supervision of the competent local authorities. Such legislation would be likely to be effective in order to facilitate the establishment of a trusting relationship between the developer and the community, whose establishment appears to be a key issue in avoiding local divisive controversies.

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Appendix A The postal survey questionnaire

Please fill in the questionnaire ticking the boxes of the answers of your choice or writing your answers in the spaces provided

1. What is the highest educational level that you have attained?

□ primary school /vocational	□ graduate level	□ professional
□ secondary school	□ postgraduate level	

2. How many people are there in your household including yourself? Please write the number ……

3. What is your approximate household income before tax each year?

□ under £10,000 per year	□ £20,000-£29,999	□ £50,000-£79,999
□ £10,000-£19,999	□ £30,000-£49,999	□ £80,000 or more

4. Please say what you think are the correct answers to the following questions about wind power

4.1 How much pollution do wind turbines produce in comparison with coal-fired power stations?

□ more pollution □ less pollution □ I don't know

4.2 Is the electricity produced by wind turbines cheaper or more expensive to produce than electricity produced by other means such as coal-fired power stations?

□ cheaper □ more expensive □ I don't know

4.3 Whatever the location, do wind turbines produce a steady stream of electricity?

□ yes □ no □ I don't know

4.4 When people talk about renewable energy, do they consider wind power to be a type of renewable energy?

□ yes □ no □ I don't know

5. Are you aware that the '.....' wind farm has been proposed in your local area?

□ yes □ no

6. Can you see from your home '.....', the site of your proposed local wind farm?

□ yes □ no □ I don't know where the site is

6.1 If you answered NO: How often do you see the wind farm proposed site?

□ never □ rarely □ sometimes □ often □ very often

7. What do you think of the presence of this wind farm in your area?

I.....

strongly disagree □ disagree □ neither agree nor disagree □ agree □ strongly agree □

7.1 Why? Please briefly explain the reasons for your choice (please write)

.....

.....

.....

.....

Please say if you AGREE or DISAGREE with the following statements:

8. I trust the developers of the wind farm in the way they deal and have dealt with the local community

strongly disagree □ disagree □ neither agree nor disagree □ agree □ strongly agree □

9. I feel that I have been thoroughly informed about the wind farm

strongly disagree □ disagree □ neither agree nor disagree □ agree □ strongly agree □

10. Please tick the box of the ONE statement that you agree with:

I think that the local wind farm will bring LOCALLY....

many benefits and no disadvantages □

more benefits than disadvantages □

neither benefits nor disadvantages □

more disadvantages than benefits □

many disadvantages and no benefits □

Please read the following statements and say if you AGREE or DISAGREE

The wind farm will...	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
11 ...harm the health of my community					
11.1 ...help to fight climate change					
11.2 ...look bad on the landscape					
11.3 ...improve the local economy					
11.4 ...bring down the local property prices					
11.5 ...attract tourists					
11.6 ...be unpleasantly noisy					
11.7 ...generate costlier electricity than if it was generated by ordinary fuels					
11.8 ...help to free the country from dependence on foreign fuels					

Please read the following information before continuing to fill in the questionnaire

- A **community wind farm co-operative** is a form of community ownership of wind farms. In this scheme the revenue from the wind farm goes to individual shareholders, the members of the co-operative, who are local residents that bought one or more shares. A minor part of the revenue can be spent on community projects. A co-operative is owned by its members and every member has the same right to have a say in the business regardless of the number of shares that he or she owns.

- A **community fund** is another option to benefit the local community. It is not a form of ownership but is set up by the wind farm developer, who agrees to pay into the fund a sum of money which the community will spend on projects for its own benefit. It will be managed on behalf of the community by a community trust or by the local authority.

12. Are you aware of any of the following schemes being proposed near you?

a 'community fund' sponsored by the developer of the wind farm □

a 'community wind farm co-operative' to allow residents to buy shares in the wind farm □

a different scheme from those listed, which is (please specify)..... .....□

I am not aware of any scheme □

If a ‘community wind farm co-operative’ was proposed for your area, would you AGREE or DISAGREE with the following statements?

The co-operative....	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
13. ...would just be a ploy to buy residents’ consensus					
13.1 ....would give locals the chance to benefit from the revenue of the wind farm					
13.2 ....would create a permanent divide in the local community between those who would join and those who would oppose the wind farm					
13.3 ....would persuade those who are undecided to support the wind farm					
13.4 ....would offer the worst compensation for those who oppose the wind farm because their decision not to join means they would not receive any revenue					
13.5 ....would involve local people not only financially but also in its management: it would create a stable network of local residents who might support further community activities and projects					

13.6 ....would persuade even opponents of the wind farm to accept the development					
13.7 ....wouldn't make any difference. People would support or oppose the wind farm regardless of whether there is a co-operative scheme or not					

14. Would you invest in a 'community wind farm co-operative', if this was proposed for your local wind farm and the minimum requested investment was £250?

yes □ no □

Please give reasons for your last answer: look at the following list of statements and say if you AGREE or DISAGREE

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
15.1 I think that it would be a good investment opportunity					
15.2 I oppose the wind farm so I would never join in					
15.3 I believe that we all should do something to fight climate change, therefore I would join					
15.4 I couldn't afford to buy the shares					
15.5 If people around me, in my community, would support it, so would I					

15.6 I don't care about the wind farm and so I would not care about the co-operative					
15.7 I would be able to have a say in the development of the wind farm and its management					

15.8 None of the above, the reason being (please write).....
.....

16. All in all, what do you think of a 'community wind farm co-operative'?

□ it is a very bad idea □ it is a bad idea	□ I have no opinion on this	□ it is a an excellent idea □ it is a good idea

If you could choose ONE of the schemes that we have presented for your local wind farm, which one would you choose? Please mark your answer of choice, please choose only ONE answer

1. 17 a 'community wind farm co-operative' in which residents invest to buy affordable shares and therefore receive an annual revenue □
2. 17.1 a 'community fund' sponsored by the developer/owner of the wind farm which will fund community collective projects (e.g. a community hall) □
3. 17.3 I have no preference □

Which ONE of the following statements describes best what you think?

I think that ….

- 18. .....we all have to do something to protect the global environment because we all share planet earth □
- 18.1 .....we all have to do something to take care of our country's environment because that is in our best interest □

- 18.2 .....we all have to do something to protect our local environment, because it’s the place where we live with our families, in our communities □
- 18.3 .....it’s a matter for the government, not us, to take care of the environment □

Please tick the box of the ONE statement that you agree the most with:

- 19. the environment should be the priority of the government even if this means damaging the economy □
- 19.1 the environment should be the priority of the government but this should not damage the economy □
- 19.2 the economy should be the priority of the government but this should not damage the environment □
- 19.3 the economy should be the priority of the government even if this means damaging the environment □

Please say if you AGREE or DISAGREE with the following statements

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
20 I like how my area looks					
20.1 I like my community					

Thank you for filling in the questionnaire.

Please return the questionnaire free of charge using the envelope provided.

Appendix B The qualitative study interview guide

The present section is intended to justify the rationale of choice of specific questions for the interview schedule. Arksey and Knight (1999) consider a document that explains the choice of questions useful for the purpose of building more effectively the interview guide.

Provisional research questions at the first stage of data collection were:

1. Which factors do influence participation in cooperatives producing green electricity? How do they relate one to each other?
2. Is the cooperative scheme effective in eliciting participation of local communities and in overcoming opposition toward wind developments? Why?
3. Do individuals perceive their status of citizens as a source of moral obligation to protect the environment? (In other words: is 'environmental citizenship' perceived as a source of moral obligation to protect the environment?)
4. Which attitudes are held by stakeholders and citizens toward the social enterprise and community owned schemes of wind farms?

As Kvale (1996) points out, questions included in the interview guide have to be tied with research questions and each question of the guide can answer one or more research questions as these likely will be answered by several questions included in the interview guide.

Wengraf (2001) distinguishes between 'theory questions' and 'interview questions', stressing that despite they point to the same research aim, theory questions are formulated with theoretical concepts and couldn't be administered to interviewees who would not understand them. Theory questions rather serve the purpose of constituting a useful intermediate stage between the research questions and the actual interview questions.

In the following interview guide, only our interview questions are presented to the reader, specifying the research questions that they refer to.

Several versions of the interview guide were written and these were reviewed by the supervisory team and two PhD students of the same department, working on environmental social research projects.

Further, as advised by Wengraf (2001) the final version of the interview guide was tested with mock interviews with three PhD students and the interview time was recorded: the time of each interview ranged from 30 minutes to 1 hour, depending on the willingness of the interviewee to elaborate on his answers.

Probes and prompts were prepared as suggested by Wengraf (2001) but only in a minimal amount. In fact it was aimed to conduct the interview in a flexible way, allowing for enlarging on a theme depending on the willingness of the interviewee to elaborate on it, and leaving open the interview to some degree of departing from the original interview guide, in case the interviewee would have brought up interesting issues, which might have been perceived as relevant in addressing the research questions. With regard to this, it was improvised during the interviews what Kvale (1996) calls 'follow-up questions' and it was considered necessary to adhere to his view that "The key issue here is the interviewer's ability to listen to what is important to the subjects, and at the same time to keep in mind the research questions of an investigation" (Kvale, 1996, p. 133).

Interview guide

The following forewords were meant to introduce the theme of the research to the interviewee and to ask consent for the interview recording. The provision of a great amount of details regarding the research topic is avoided to exclude introducing terms and topics that could be confusing and generating the impression that the interviewer holds a personal stance on the topic. This is not unusual, Kvale (1996, p.113) writes: "Providing information about a study involves a careful balance between detailed over-information and leaving out aspects of the design that might be significant to the subject. In some interview investigations, the specific purposes of a study are initially withheld, in order to obtain an interviewees' natural views on a topic and to avoid leading them to specific answers."

The introduction had also the purpose of re-introducing, (the first introduction was made during a first telephonic contact), the interviewer and reassuring the interviewee about the conditions in which the interview was carried out. The interviewee was reassured

about confidentiality, about her faculty of pulling out of the interview at any time and about an impartial non-judgemental attitude on the interviewer part. Eventually, interviewees' agreement about interview recording was requested.

Confidentiality was here intended in the sense defined by Kvale (1996, p.114) "Confidentiality in research implies that private data identifying the subjects will not be reported". This definition equals the definition of 'anonymity' given by Wengraf (2001) who instead gives a broader sense to 'confidentiality', which in his view can correspond to an absolute degree of confidentiality, implying that not only the identity of the interviewee, but the whole interview content cannot be made public.

The following introduction was used:

I am a PhD student. My research regards acceptability of wind farms at the local community level. There is currently a debate in the country about a possible larger deployment of renewable energy, particularly regarding onshore wind farms. The great importance of this debate is evident for the energy future of Britain. I am going to ask you some questions related with this now. I wish underline that there are no right or wrong answers to my questions, so please feel completely free to express any opinion.

All your answers will be treated as confidential and you can decide to withdraw at any stage of the interview. I would find useful to record the interview in order to report exactly your opinions, do you agree?

Warm up question

This question is posed to allow the interviewee to start comfortably the interview. The topic is trivial but it will also be useful for the interviewer to ascertain the respondent's perception of himself and his role with regards to the wind farm.

Could you please describe yourself and your role in your group/organization/institution?

I - Responsibility, citizenship, participation

These questions refer to the research question n.3: Do individuals perceive their status as citizens as a source of moral obligation to protect the environment? (In other words: Is

environmental citizenship perceived as a source of moral obligation to protect the environment?)

1. *Who or what do you think is responsible for causing climate change?*

Probe: Is that your personal view or your organization's one?

This probe will be repeated through all the questionnaire whenever it is needed to ascertain if the opinion presented is a personal position or if it represents the views of the group/institution to which the respondent belong. In case this is not made explicit by the interviewee, it was assumed that she was presenting her personal views.

2. *Have you ever come across the concept of citizenship? What does it mean to you?*

If needed, the concept of citizenship was essentially recalled with reference to the environment to allow the respondent to see the connection between the citizenship and the environmental debate.

Citizenship is the membership to the national political community. Citizens as consequence hold rights and duties towards the community. In this respect, environmental quality is a public good because it doesn't completely belong to single users, e.g. just think in the air quality, we all consume the same air. Therefore, as for other public goods (e.g. public health, security) we, as citizens, have environmental rights and duties e.g. the right to availability of clean air and the duty to avoid illegal dumping.

3. *What is your opinion about citizens' rights and duties in relation to the environment?*

Prompts: Moral rights and duties *Legal rights and duties*

Probe: How effective they are to protect the environment?

4. *If the environment belongs to everyone, who should take care of it?*

Prompts: Government *Businesses* *British citizens*

5. *What do you think about people being producers of renewable energy as a way to protect the environment?*

6. *What do you think of local community involvement in protecting the environment? Why?*

Prompts:

   a. *knowledge of the local environment*

   b. *local interests*

7. *Could you give an example of community involvement?*

Prompt: Westmill?

II - Community involvement, Social-enterprises/Co-operatives and wind farms

The following questions aim to answer to the research question 4: 'Which attitudes are held by stakeholders and citizens toward the social enterprise and community owned schemes of wind farms?'

Westmill will be a social enterprise, a co-operative in particular,

8. *What do you think of social enterprises?*

9. *And what do you think about co-operatives?*

If the respondent asked for a definition of 'social enterprise' it was provided the following presented by the Department of Trade and Industry that defines a social enterprise as *"...a business with primarily social objectives whose surpluses are principally reinvested for that purpose in the business or in the community, rather than being driven by the need to maximise profit for shareholders and owners."* (DTI, 2002, p.7)

If the respondent doesn't have clear the meaning of co-operative the following definition of the department of Trade and Industry is presented; it defines co-operatives as *"...independent, democratically controlled enterprises. They are owned and governed by their members, with the aim of meeting common social, economic and environmental needs."* (DTI, 2004a)

10. *Are there any co-operatives in your local area? Can you tell me something about them?*

11. *How are cooperatives seen by members of the public?*

Prompts: Positive/Good Negative/Bad

12. *What do you think are the advantages or disadvantages of community owned co-operatives that produce green electricity e.g. a wind farm?*

Prompts:

   a. *Are you aware of the Danish experience? Do you think it could be repeated in the UK? Why? Why not?*
   b. *Are you aware of Baywind?*

13. *What do you think of community owned co-operatives of renewable energy as a means to tackle climate change?*

14. *Do you think that renewable energy developments owned by the local community have or not the same local impact as those owned by non-local companies? Why?*

Probes:

What about the...

   a. *...local economic impact?*
   b. *...social impact on community life?*

c. *...environmental impact?*

15. *Have you ever considered the relative benefits of cheaper energy versus locally owned energy: which of these is more desirable? Why?*

III Wind farm opposition and community owned co-operative scheme

The questions of this section were aimed to answer the research question n.2: 'Is the cooperative scheme effective in eliciting participation of local communities and in overcoming opposition toward wind developments? Why?'

16. *Have you ever thought about any possible link between opposition or support and local ownership of a wind farm?*

If not clear to the interviewee, it was rephrased as follow:

Do you think that local ownership of wind farms may influence levels of opposition or support for wind farms? How?

17. *Wind turbines are sometimes controversial and local opposition is often present. Could the local ownership of the wind farm with its revenue put back into the local community, compensate for the perception of local negative consequences of a wind farm such as noise and visual impact?*

IV Perception of factors influencing participation in community owned co-operatives

This question was aimed to answer the research question n. 1: 'Which factors do influence participation in cooperatives producing green electricity? How do they relate one to each other?'

18. Have you ever discussed in your group/organization/institution what could motivate or prevent local residents to purchase shares in a local co-operative wind farm? What do you think about it?

It was impossible to prompt all the factors raised in the literature review, therefore leaving the question completely open appeared to be the most reasonable choice.

Debriefing

As the literature suggests (Kvale, 1996, Wengraf, 2001), it was asked the interviewees for final comments or additions on either the issues already discussed or on issues possibly missed. Eventually we gave our availability to be contacted and we further reassured about confidentiality.

19. Is there anything more that you would want to add?

The content of this interview will be kept as confidential and will be used for the sole purpose of the research. You can contact me at any time to be informed about the use of the record of this interview in my research. I will produce a report regarding the interviews conducted therefore if you are interested I can send you an electronic copy.

Questions' order

The order of the questions, or 'sequence schedule' as Wengraf (2001) calls it, is motivated by their topic. First, talking of the topic of responsibility and citizenship seemed more appropriate before introducing the specific case of citizens' engagement in community owned wind farms. Second, the fact of introducing questions that could lead the interviewee to consider the relation between citizens and environment seemed useful to fully bring back to their minds the opinions that they held and that shaped their position about the specific debate regarding the wind farm. Therefore, passing through the questions about advantages and disadvantages of the social enterprise/co-operative scheme was likely to lead the respondent to be ready to answer a specific question about

the suitability of the scheme to overcome opposition, and finally to answering about why people could be or not interested in participating.

Therefore, jumping to the central issue about the co-operative scheme and its suitability to avert local opposition was avoided, also because this would have possibly disposed negatively the interviewees that were opposing the development, or it might have led some interviewees to please the interviewer answering accordingly to an erroneously perceived aim of the interview. With regard to this, Wengraf (2001, p.162) warns that "...once the interviewee grasps the theoretical point of the questioning , he or she may consciously or unconsciously change the way in which they respond...".